

# Company Profile 公司简介



## Scale 规模

BVEM existing CNC machining workshop, electrical assembly shop, storage warehouse, test site, 23,000 square meters, and with marketing department, R&D department, after-sales department and construction department.

北京振冲工程机械有限公司拥有数控加工车间、电气装配车间、仓储库房、试验场地共23000平方米，并设有市场部、研发部、售后部及工程部。

## Profession 专业

BVEM focuses on professional vibroflot and related equipment manufacturing and infrastructure construction. It was named Asia's largest manufacturer of electric vibroflot complete sets of equipment, Chinese electric vibroflot device specification editor unit.

北京振冲工程机械有限公司定位于专业的振冲器及相关设备制造及基础工程施工公司。是亚洲最大的电动振冲器成套设备制造商，中国电动振冲器生产制造规范主编单位。

# Automated production and assembly

## 自动化生产加工与装配



### 成品区展示

### Finished product area display

# Honors and Patent

## 荣誉与专利

CNC machining center for automated production, automatic assembly equipment for chemical be installed to ensure the efficient production, product precision. BVEM is always oriented by the technology, insist in taking the science and technology as the developing motive force, and put increased investment into science and technology, focusing on new technology, developed its own 30kW-260kW electrical vibration with full supporting and wide application, has won nearly thirty vibrator related patents which are successfully successfully applied to the Yangtze River three gorges soft foundation treatment project, Hong Kong-Zhuhai-Macau Bridge gravel pile project, the Dubai palm island soft foundation treatment project and other typical cases.

采用数控加工中心进行自动化生产，自动专用化工装进行设备装配，保证生产高效性、产品精密性。北京振冲工程机械有限公司坚持以技术为导向。以科技为动力，不断增加科技投入，注重新技术研发，自行开发研制了30kW-260kW 电动振冲器，配套全面，适应范围广，获得近三十项振冲器相关专利，并成功应用于长江三峡软基处理工程、珠港澳大桥人工岛碎石桩工程、迪拜棕榈岛地基处理工程等典型工程案例。



# Vibro techniques

## 振冲技术

### The techniques 技术

The depth vibrator is used for 2 distinct techniques which differ both in their soil improvement and in their load transfer mechanism. They are Vibro Compaction technique and Vibro Replacement technique.

振冲法分为振冲挤密和振冲置换两种技术，分别用于改善不同土壤条件，以适用不同的地上物承载要求。

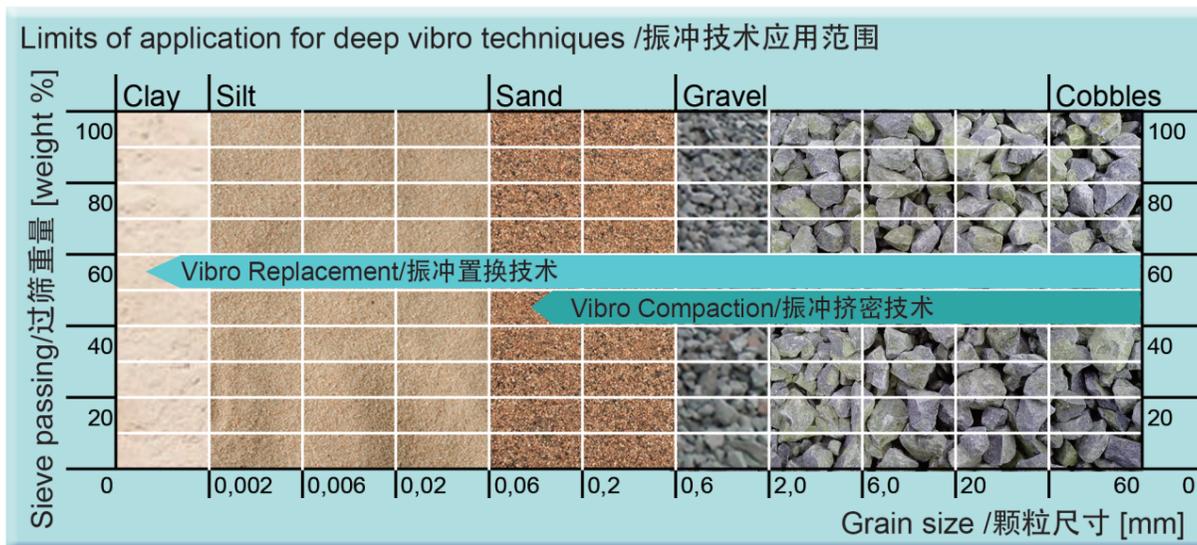
### The benefits 优势

The deep vibro techniques present a very versatile ground improvement method that can be adjusted to a wide variety of ground conditions and foundation requirements. Its execution is comparatively fast even if large volumes of soil are to be improved and subsequent structural works can follow very quickly. The soil improvement enables the contractor to utilise standard shallow footings which, in turn, leads to additional savings.

Another advantage is the environmental friendliness of vibro techniques, as natural and in situ materials are used. In addition, only a comparatively small quantity of soil is removed during the process.

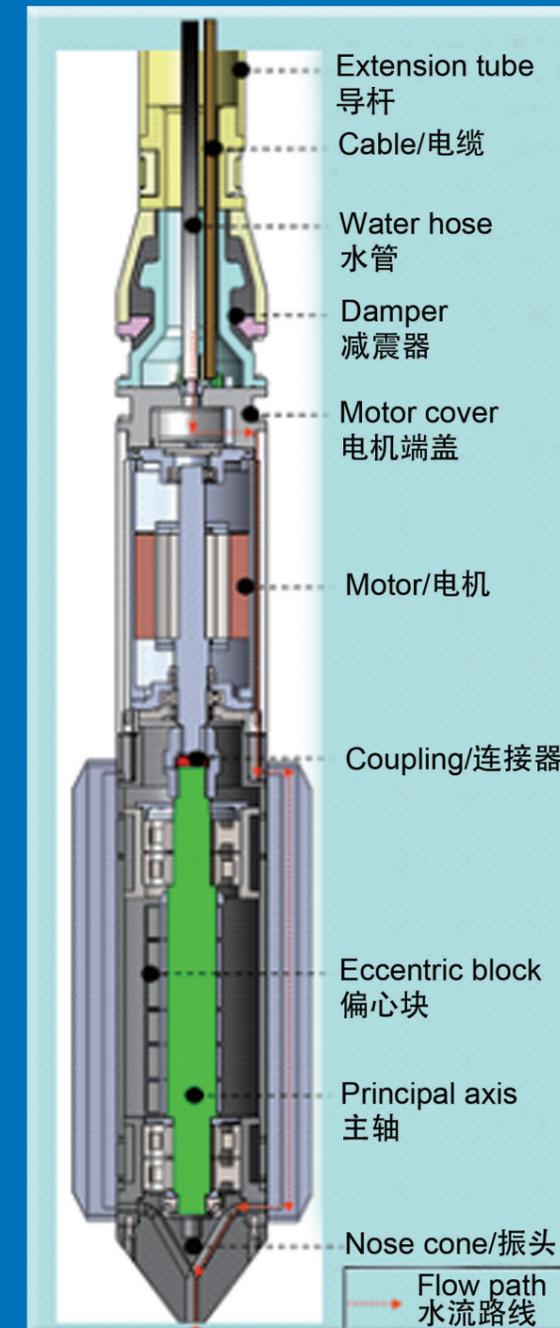
振冲技术适用地层条件广泛。

振冲技术的另一个优点是使用自然或者是现场的材料工作不会破坏环境，另外，在这个过程中只有很少的土壤被置换出来。



# Vibroflot

## 振冲器



### The working principle

The working principle of the vibrator is that the special motor mobilizes the eccentric block within the vibrating body through coupling, generating centrifugal force, and causing horizontal vibration of the whole vibrator. The vibrator can be applied in the construction of packing vibro pile and compaction vibro pile. It is applicable for the consolidation of foundations such as gravelly soil, sandy soil, silt soil, cohesive soil, artificial soil and collapsible soil etc., as well as increasing density and resisting liquefaction of various types of liquefiable soil. After vibration shock process, the stratum can stand a certain degree of dynamic load, and can improve bearing capacity of foundation soil, relative density and liquefaction resistance capacity.

### 工作原理

振冲器的工作原理是专用电机通过联轴器带动振动体内的偏心块产生离心力，使整个振冲器产生水平振动。振冲器可应用于填料振冲桩和挤密振冲桩施工。适用于砂石土、砂土、粉土、粘性土、人工填土及湿陷性土等地基的加固及各类可液化土的加密和抗液化处理。振冲处理后的地层可以承受一定的动载荷，可提高地基承载力和相对密度以及抗液化能力。

# Vibroflot classification

## 振冲器分类

### Top feed vibroflot 孔口填料振冲器

According to the different feeding mode can be vibrator and its supporting device is divided into two kinds of top feed vibroflot and bottom feed vibroflot .

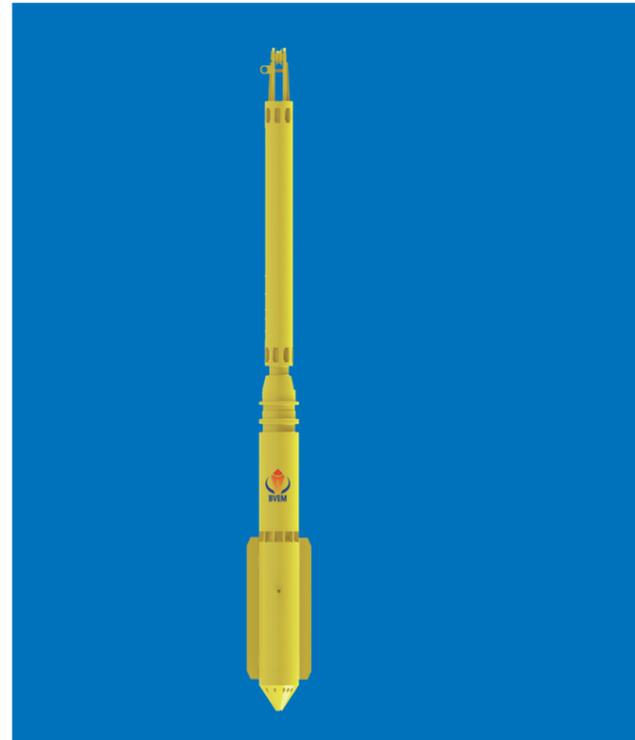
按照不同的填料方式可以将振冲器及其配套装置分成孔口填料和底部填料两种振冲设备。

The top feed vibroflot is used for vibro compaction and the top feed stone column.

It is convenient and economical solution for the ground improvement.

孔口填料振冲器被用于振冲挤密与孔口填料碎石桩工程。

一种经济、环保的土壤改良设备。



The Top Feed Electric Vibroflot Spec./孔口填料电动振冲器参数					
Type/型号	BJZC-426-75	BJZC-426-130	BJZC-426-180	BJZC-377-75	BJZC-450-260
Power/功率 (kW)	75	130	180	75	260
Rotation speed/转速 (rpm)	1450	1450	1450	1450	1450
Amplitude (at Tip)/ 振幅 (底端) (mm)	16	17.2	18.9	17.5	32
Centrifugal force /离心力 (kN)	180	208	276	188	520
Weight /重量 (kg)	2018	2320	2586	1828	3280
Diameter/直径 (mm)	426	426	426	377	450
Length/长度 (mm)	2783	2963	3100	3110	3770
Diameter of the work pile/桩径 (mm)	(1000-1200)	(1000-1200)	(1200-1500)	(800-1000)	(1500-1800)

### Bottom feed vibroflot 底部填料振冲器

The Bottom Feed Electric Vibroflot Spec./底部填料电动振冲器参数	
Type/型号	BJZC-BFS-400-180
Power/功率 (kW)	180
Voltage/电压 (V)	380
Frequency/频率 (Hz)	50
Rotation speed/转速 (rpm)	1200-1800
Amplitude (at Tip)/ 振幅 (底端) (mm)	18.9
Working pile diameter/工作桩径 (mm)	900-1200
Centrifugal force /离心力 (kN)	270
System pressure/系统压力 (bar)	6
Vibration force/激振力 (kN)	20-30
Hopper volume/料斗容积 (m³)	1.2
Pipe diameter/下料管通径 (mm)	DN250
Control type/控制形式	Inverter Control/变频控制
Cooling-down method/电机冷却方式	Circulating water cooling/循环水冷
Air flow rate/配置空压机排量 (m³/min)	10
Vibrator size/振冲器尺寸L/W/H (mm)	2600×600×700
The bin size/料仓尺寸L/W/H (mm)	4800×1300×1300
Extension tube size/导杆尺寸L/W/H (mm)	5000×300×600
Weight (Standard part+Extension tube)/标配设备重量+导杆 (ton)	9+1.3×n

It is used for bottom feed stone column.

The aggregate is always fed directly to the tip of the vibrator, creating a continuous column.

The collapse of the hole is not possible due to the compressed air even in critical soils.

No water is required, eliminating the necessity to dispose of any mud otherwise created.

底部填料振冲器被用于底部填料碎石桩工程；

碎石材料将被直接送到桩的底部，继而形成一个连续的桩；

由于是压缩空气，即便是在很差的土层中，孔也不会塌陷；

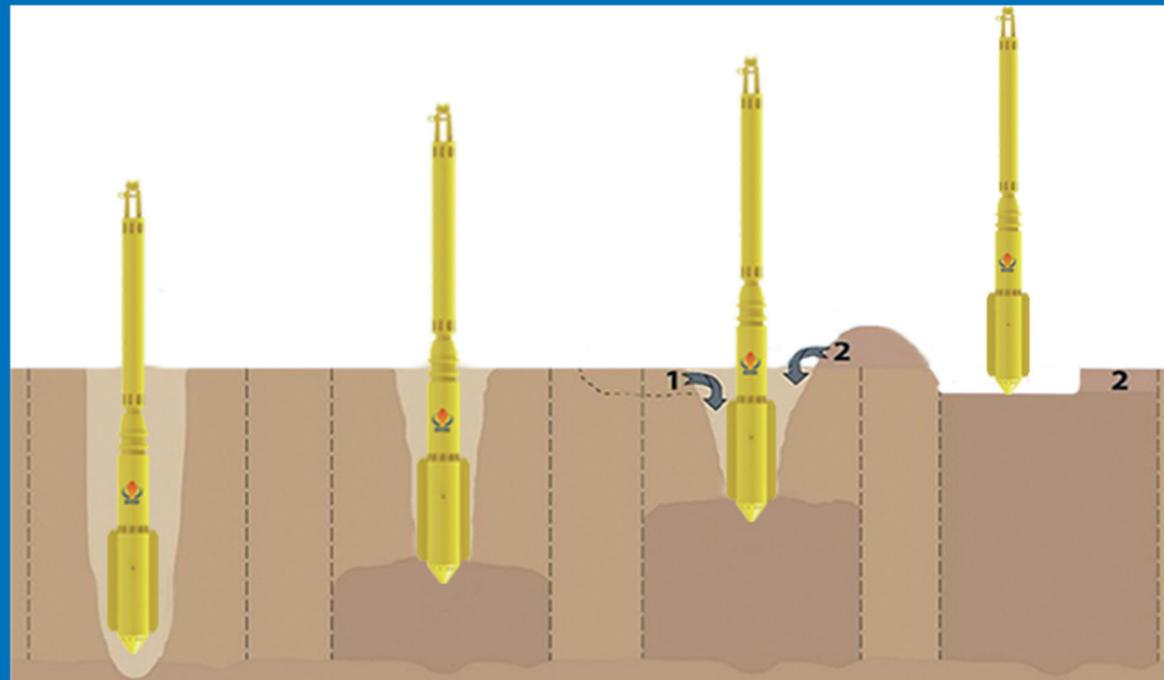
施工中只需要少量的水，因此不会造成泥浆污染。

# Vibrocompaction

## 振冲挤密

By the force of the vibroflot, enforce liquefaction of saturated sand layer, the sand particles with rearrange and pores will reduce.

通过振冲器对土体的激振力，加强饱和砂土液化，使砂颗粒重新排列，孔隙减少。



### Penetration

By vibration and the flushing of water and/or air, the vibroflot penetrates to the desired depth.

### Compaction

The vibroflot is recovered from a certain vertical distance after a verified holding time or buildup of resistance from the compacted ground.

### Completion

Immediate top layers may be leveled or impact compacted or roller compacted to ensure a ready-to-build surface.

### 造孔

利用振动和水或空气冲击，使振冲器到达设计深度。

### 加密

振冲器在每个加密段达到加密时间或加密电流的要求，逐段振密到孔口。

### 完成

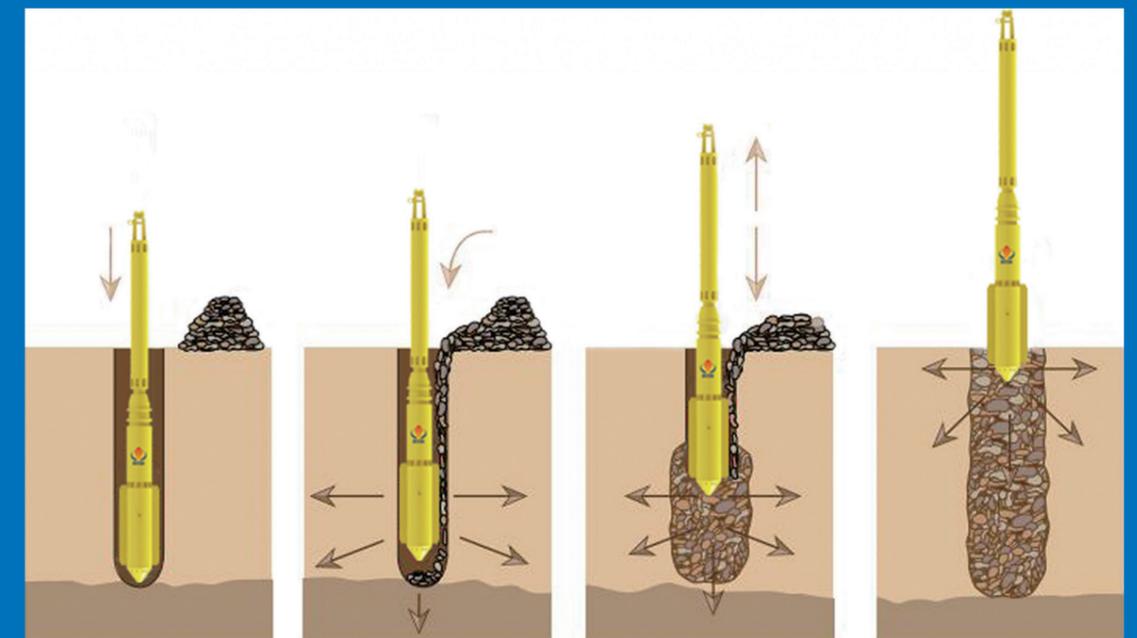
地表通过碾压，以确保下一步施工的需要。

# The top feed stone column

## 孔口填料碎石桩

Jet water and vibrate by vibroflot to form holes. Fill in pile holes by section with solid filling materials such as gravel (cobble) etc., and replace soft foundation with coarse aggregate. Compact the surrounding soil mass and vibrate till compaction, until at last forming into piles.

通过振冲器射水振动成孔，用碎石（卵石）等固体填料分段填充桩孔，以粗骨料置换软弱地基，挤密周围土体，并振实直至最后成桩。



### Penetration

The vibroflot penetrates and 'washes' the hole in preparation for the stone transport within the hole.

### Installation

During the introduction of the stones, water and air are flushing in order to create a positive flow for the stone transport.

### Completion

The vibroflot is frequently moved up and down in order to form and compact a column. Thereby, the surrounding ground is horizontally compressed and improved. The column is able to support high vertical loads.

### 造孔

利用振动和水或空气冲击，使振冲器到达设计深度，为向孔内填料做准备。

### 填料

在填料过程中，水和空气的冲压为填石头创造轨迹。

### 完成

振冲器的频繁上下移动形成致密的石柱。因此，周围的地面土壤得到压缩和改进。碎石桩有很好的纵向承载力。

## The bottom feed stone column project

底部填料碎石桩工程

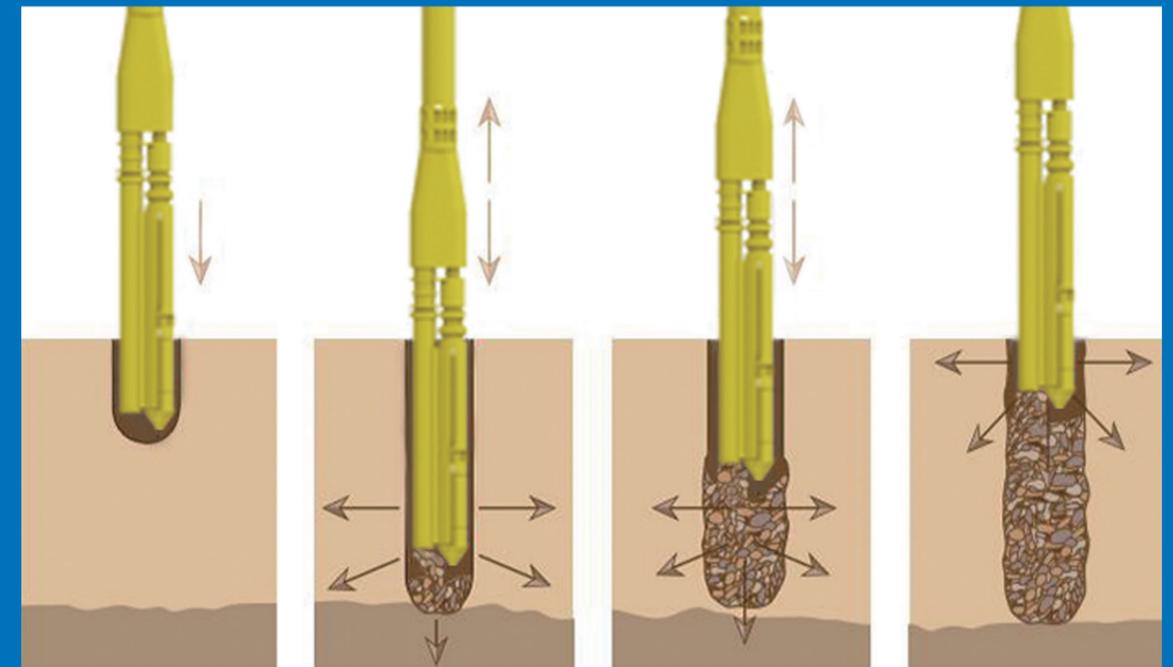


## The bottom feed stone column

### 底部填料碎石桩

The bottom feed vibroflotation probe suspended crawler crane or leader has a gravel feeling pipe connected with side of the probe and also a gravel bucket for filling the gravel hopper which is movable up and down using with crane ropes or leader ropes as an optional.

底部填料振冲碎石桩工法主要是由履带吊或者汽车起重机作为起吊主机，由提升料斗、料仓、旁通料管、振冲器等部分组成。通过吊机主钩控制振冲器的打桩深度，通过吊机副钩来提升料斗完成上料。



Positioned vibroflotation probe suspended from a crawler crane or leader allows it to penetrate the soil simultaneously by injecting water or compressed air up to the desired depth. When desired depth has been reached, the vibroflotation probe pulled up around 1 m and upper gate of gravel pipe opened and the hole created by vibroflotation probe filled by gravel. The vibroflotation probe lowered down until the gauge of electronic data logger indicates that the specified compaction pressure has been reached. This process is repeated until the vibroflotation has either been extracted completely from the soil or else until its head has arrived at the upper side of the formation that is to be compacted.

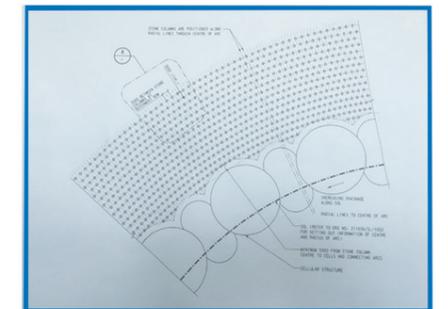
在施工的过程中，吊机牵引振冲器，配合高压水和空气造孔到指定深度，然后打开振冲器旁通料管阀门，向孔底填料，达到该深度所需石料时，料阀关闭。振冲器上提一定距离，料阀打开，继续释放石料，同时自动记录仪记录当前位置、电流、填料量、深度。重复上述过程直至振冲器完全被提到地面，此时一根桩即算完工。

## 干法底部填料应用于港珠澳大桥人工岛



The project of the Hong Kong-Zhuhai-Macau Bridge artificial island use Dry Bottom Feed Vibro Stone Column technology, the total length of seawall is about 6296m, building area of the island has 1.4968 million square meters, it has 46 thousand gravel piles, The footage is about 1,100,000 linear meters.

## Dry Bottom Feed Vibro Stone Column pile for Hong Kong-Zhuhai-Macau Bridge artificial Island



香港珠海澳门大桥人工岛使用干法底部填料振冲碎石桩技术，海堤总长度约6296m，岛上的建筑面积有1496800平方米，有46000个碎石桩，进尺约110万米。

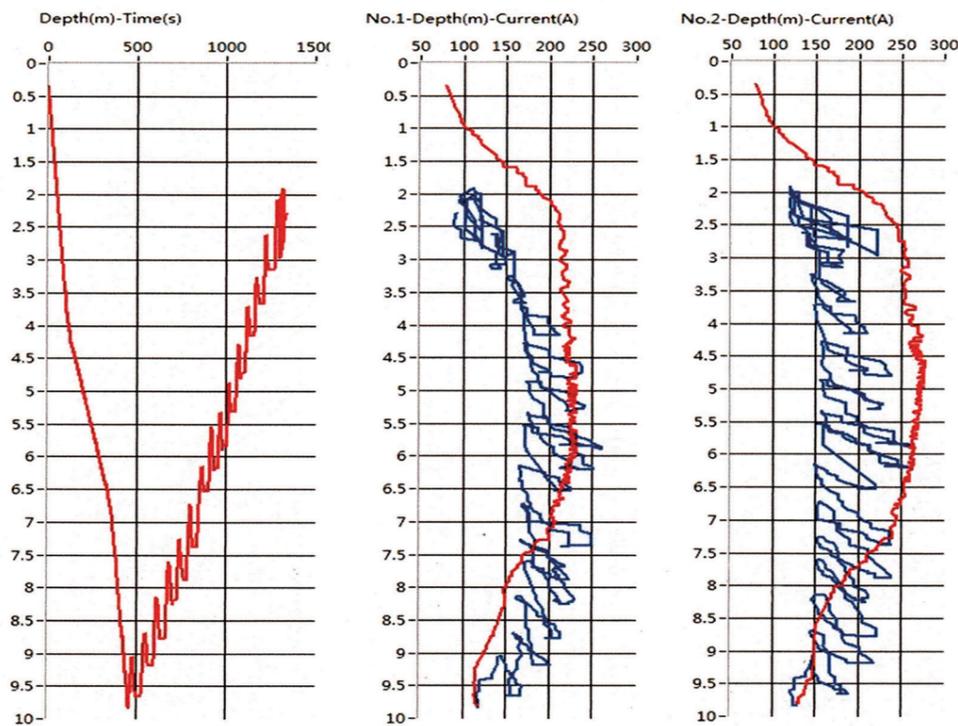


# Quality Control of pile 桩体质量控制

## Recorder 记录仪

Real-time monitoring and recording of the current, voltage, pile depth and filler content of construction equipment.

实时监测并记录施工设备的电流、电压、桩深及填料量变化。



北京振冲工程机械有限公司  
Beijing Vibroflotation Engineering Machinery Co., Ltd.

公司成立于2006年, 拥有规模化、数控化生产线, 振冲设备已形成功率从300KW至2600KW, 可满足大型项目快速施工设备需求。  
主营业务: 振冲器及配套具的研发、生产、销售、维修、租赁及桩基施工。  
Established in 2006 owns a scale, automated CNC production lines, and vibroflot equipment with the power from 30KW to 260KW, satisfy the large-scale projects rapid construction equipment requirements.  
The main business includes: R&D, production, sales, maintenance, leasing of vibroflot and ancillary equipment and construction of pile foundation.

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ADDRESS: 500 meters east of Xiao Pu roundabout Tongzhou District Beijing, 101118 China.

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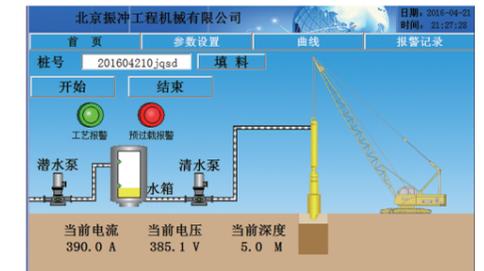
## 产品优势 Advantage

### 远程控制监测

长达100米的远程控制功能, 实时准确地监测施工电流、成桩深度、填料量, 对施工进行很好的质量控制。

### Remote control and monitoring

Up to 100 meters of remote control function, real-time and accurate monitoring of construction current, the depth of the pile, filler, the construction of a good quality control.

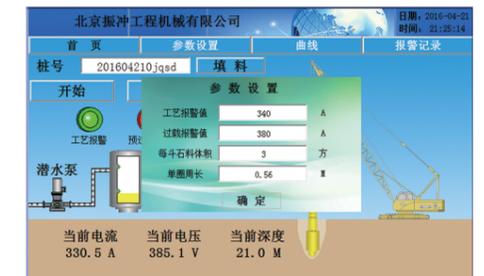


### 触屏功能

显示屏采用高可靠性工业触控屏, 方便快捷的设置参数, 更加智能高效。

### Touch screen function

Display with high reliability industrial touch screen, convenient and quick setting parameters, more intelligent and efficient.



### 双语设计

设置中英文两种语言界面, 促进国际化交流。

### Bilingual design

Equipment set up English and Chinese two languages to promote international exchange.

# Quality Control of Pile

## 桩体质量控制

### Inverter Control Cabinet 变频电控柜



Technical spec./技术参数	Inverter control cabinet/变频电控柜
Inverter model/变频器型号	英威腾GD200-200G/220P-4
Cabinet protection grade/保护等级	IP65
Input/输入频率(Hz)	47~63Hz
Input/输入电压(V)	AC380V(-15%)~440V(+10%)
Altitude/海拔	1000m以下, 当海拔高度超过1000m后, 请按照100m降额1%的比例降额。
Temperature/温度	"-10至+50℃"当环境温度超过40℃后, 请按照1℃降额3%的比例降额。
Weight and Dimensions/重量和尺寸	
L/W/H(m)	1.1×9×1.7
Weight 重量/kg	500

The inverter control cabinet adjusting vibrator vibration frequency according to the electric vibrator on the resonance frequency of different strata, so as to better improve the bearing capacity of foundation pile can increase the stability of the foundation, improve the anti liquefaction ability;

The high reliability of industrial material, good dustproof, waterproof, corrosion;

It controls the use of vibrator and its ancillary machines, and has protective measures for each construction machine. When the vibration motor start, Through the inverter control, the vibrator will start smoothly,. So can avoiding the above problems.

变频电控柜可根据电动振冲器对不同地层的共振频率调节振冲器自振频率, 从而能够更好地提高地基承载能力, 增加地基稳定性, 提高抗地震液化能力;

采用高可靠性工业材质, 能够很好地防尘、防雨、防腐蚀;

变频电控柜控制振冲器及其配件, 施工时, 在变频电控柜的控制下, 振冲器缓慢启动, 以保证各配套机具的安全平稳运行。

## 工程业绩

公司凭借高效优质的振冲器设备的优势, 在水利水电基础建设的振冲桩地基处理技术上取得了辉煌的成绩。

## Engineering performance

With the self-owned, efficient and high-quality vibroflot equipment, the company has maintained long-term development in the vibroflotation pile foundation processing technology of water conservancy and hydropower in frastructure.

Construction site: Dubai  
 Project objective: Deira islands development  
 Project type: Compaction

施工地点: 迪拜  
 工程项目: 德拉群岛开发  
 项目类型: 振冲挤密桩



Engineering construction and  
 equipment exhibition on the world

国内外施工工程及设备展示



Construction site: Dhaka, Bengal  
 Project objective: Construction of thermal power station  
 foundation  
 Project type: Compaction  
 Engineering area: 500 thousand square meters  
 Pile depth: 20 m

施工地点: 孟加拉, 达卡  
 工程项目: 火电站基础建设  
 工程类型: 振冲挤密桩  
 施工面积: 50万平方米  
 施工深度: 20m



Over water vibroflot gravel pile for northern  
 breakwater project in Changxing Island, Dalian  
 大连长兴岛北防波堤工程水上振冲碎石桩工程



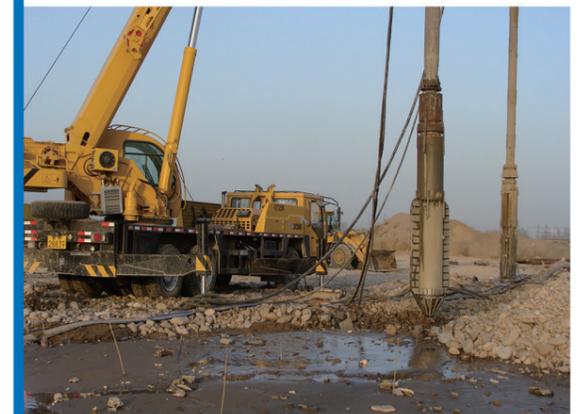
Dams construction project in building materials  
 landfill area in Cotai Aomen  
 澳门路氹建筑物料堆填区堤堰建造工程

Construction site: Kuantan, Pahang, Malaysia.  
 Project objective: Reclamation works phase 1 for new deep  
 water terminal at Kuantan port  
 Project type: Compaction  
 Engineering area: 600 thousand square meters  
 Pile depth: 15 m

施工地点: 马来西亚, 关丹  
 工程项目: 关丹港新的深水码头填海工程1期  
 工程类型: 振冲挤密桩  
 施工面积: 60万平方米  
 施工深度: 15m



Tank 1 #, 6# project of Caofeidian oil terminal and  
 ancillary facilities  
 曹妃甸原油码头与配套设施1#、6#罐工程



Beijing Sanhaizi country park vibroflotation  
 gravel pile project  
 北京三海子郊野公园碎石桩工程



Foundation processing project for Jidong Oil Field No.1 Structure No.2 artificial island project  
冀东油田1号构造2号人工岛工程地基处理工程



Fundamental vibroflotation project of Inner Mongolia Wulashan Power plant  
内蒙古乌拉山电厂基础振冲工程



Malaysia electrified double-track railway project  
马来西亚电气化双轨道铁道工程 (EDTP)



Vibroflot pile for 5million tons annual condensate oil project in Algeria  
阿尔利亚 500 万吨年凝析油项目振冲桩



Yunnan Dazhuang Dam vibroflotation project  
云南大庄水坝振冲工程



United Arab Emirates WHITE BAY foundation treatment project  
阿联酋WHITE BAY地基处理工程