

A city skyline with various skyscrapers, including a prominent tall, thin tower and a curved building, set against a light blue sky. The skyline is reflected in a yellow horizontal band below it.

Hebei Shaotong Aoda Technology Co., Ltd

A stylized world map composed of a grid of small squares, centered behind the text.

Magnetron guiding instrument series products

Dedicated to trenchless directional drilling,
oil, coal-bed methane, salt mines,
and geothermal wells

Contact: Manager Yuan

Telephone: 13720016711

Address: Hebei Province, Sanhe City, Yanjiao
Economic Development Zone Yanshun Road east

URL: www.sotod.cn₁₁

Company Profile

Hebei Shaotong Aoda Technology Co., Ltd. is a technology-oriented enterprise based on the research and development and production of magnetic-oriented measuring instruments required for oil, coal-bed methane, geothermal, salt mines, and trenchless construction, supplemented by engineering construction

Company business philosophy

The company adheres to the business philosophy of integrity and mutual benefit, backed by a strong R & D team, with foreign instrument indicators as the benchmark, to provide customers with the best service and the most affordable price, in the field of oil, coal-bed methane, salt ore, geothermal and trenchless construction measuring instruments to make the instrument completely localization, breaking the foreign technology blockade.

Main scope

- Oil, coal-bed methane, geothermal, salt mines, needle shafts, horizontal docking, trenchless geomagnetic guided construction services
- R&D, production and sales of instruments required for oil, coal-bed methane, geothermal, salt mines, needle shafts, horizontal docking wells, and inclined docking wells
- Non-excavation AC guidance instrument, non-excavation horizontal docking rotational magnetic guidance required instrument research and development, production and sales

C2 Wired AC Geomagnetic Guide Instrument (Wireframe)

Instrument composition:

- Upper straightener
- Conversion electrode
- Probe sticks
- Lower straightener
- Extension bar
- Shunt
- Dedicated data processor
- AC signal power
- Engineering computers



关键技术

Instrument Introduction:

"C2 AC Traverse Guide Instrument" is specially designed for trenchless construction, providing high-precision trajectory measurement and guiding positioning for horizontal directional drilling traversal engineering to ensure that the trajectory control of the guiding hole meets the design requirements, and at the same time provide magnetic positioning accuracy guarantee for the implementation of long-distance docking traversal engineering. In addition to the conventional geomagnetic guided trajectory measurement function, the AC traversal guidance system adopts the method of arranging AC wireframe and magnetic target, and the location of the underground directional instrument can be found by generating an artificial AC magnetic field, and the trajectory of inertia calculation is corrected to ensure the smooth completion of the construction. The software adopts a graphical user interface, designed using C# language, with friendly interface, widely applicable to computer systems, easy to operate advantages, support Chinese and English dual interface function.

C2 Wired AC Geomagnetic Guide Instrument (Wireframe)

Measurement range and accuracy:

inclination: $0\sim 180^\circ$, $\pm 0.1^\circ$

azimuth: $0\sim 360^\circ$, $\pm 0.3^\circ$

Tool face: $0\sim 360^\circ$, $\pm 0.5^\circ$

Signal stabilization transmission distance: more than 5 km

working conditions:

Maximum operating temperature: $-20\sim +125^\circ\text{C}$

Maximum pressure resistance: 100Mpa

Positioning accuracy:

Left-right error less than 0.5% of wireframe width

The up-down error is less than 1% of the width of the wireframe.

The construction depth is more than 100 meters

Instrument technical features:

- 1: The self-developed magnetic field positioning algorithm does not have the accumulated error of traditional instruments and has strong anti-interference ability.
- 2: In-depth error analysis and sensitivity analysis can effectively control the calculation accuracy.
- 3: Complete digital signal processing technology can effectively suppress noise interference, accurately extract signal characteristics, and transmit more than 5 kilometers of signal transmission distance.
- 4: The temperature resistance, shock resistance and stability of the instrument are produced according to petroleum standards

Ground coil characteristics

- The wireframe carries a 0-10A forward-spin signal
- Accuracy can be down to centimeters
- Depth measurement range greater than 100 meters
- Super anti-interference ability
- A large wireframe can be arranged from the point of entry to the point of excavation

Excavation side loop

The guide coil is laid along the axis of the design curve

Into the soil side circuit

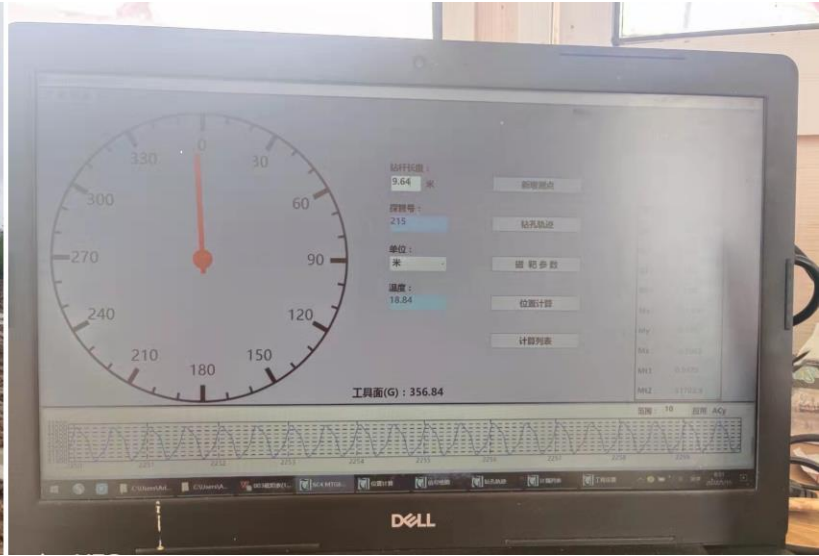
Guide coil

Guide coil

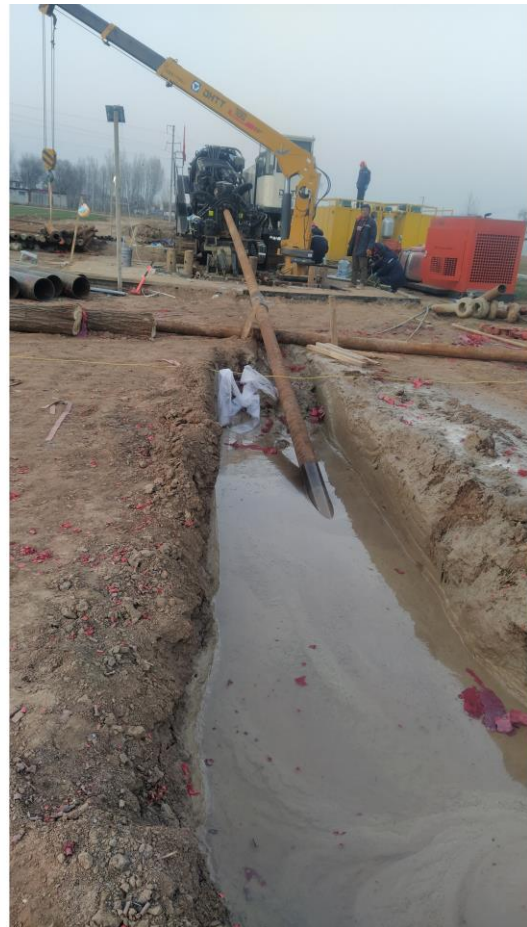


Classic case of C2 construction

In 2022, the Lianyang River trench in Shantou, Guangdong Province, crossed, with a total length of 1600 meters, a vertical depth of 32 meters, a right arc of 26 meters, and the top pile was excavated.



In 2021, the Linzhang section of the South-to-North Water Diversion Project has a total length of 1980 meters and a depth of 27 meters, which is accurately excavated.



C3 Rotary magnetic guide instrument

Instrument composition

- Salvage head
- Conversion electrode
- Probe sticks
- Weighted rod
- Strong magnetic connector
- Dedicated data processor
- Engineering computers



Instrument Introduction:

C3 rotary magnetic guide instrument is Hebei Shaotong Aoda Technology Co., Ltd. independent research and development of accurate magnetic field positioning communication instrument, in the function to achieve vertical docking, double horizontal docking, large slope docking function, the system using graphical user interface, using C# language design, with friendly interface, widely applicable to computer systems, simple operation advantages, and support Chinese and English interface. Software does not have high hardware requirements, and current mainstream computers can meet the operating requirements.

Instrument technical characteristics:

- 1: The self-developed magnetic field positioning algorithm does not have the accumulated error of traditional instruments and has strong anti-interference ability.
- 2: In-depth error analysis and sensitivity analysis can effectively control the calculation accuracy.
- 3: Complete digital signal processing technology can effectively suppress noise interference, accurately extract signal characteristics, and transmit more than 5 kilometers of signal transmission distance.
- 4: The temperature resistance, shock resistance and stability of the instrument are produced according to petroleum standards

C3 Rotary magnetic guide instrument

Measurement range and accuracy:

inclination: $0\sim 180^\circ$, $\pm 0.1^\circ$

azimuth: $0\sim 360^\circ$, $\pm 0.3^\circ$

Tool face: $0\sim 360^\circ$, $\pm 0.5^\circ$

Signal transmission distance: more than 5,000 meters

working conditions:

Operating temperature: $-20\sim +125^\circ\text{C}$

Maximum pressure resistance: 100Mpa

Positioning accuracy:

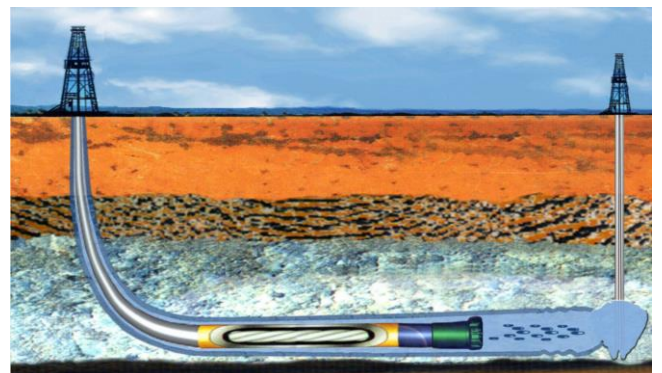
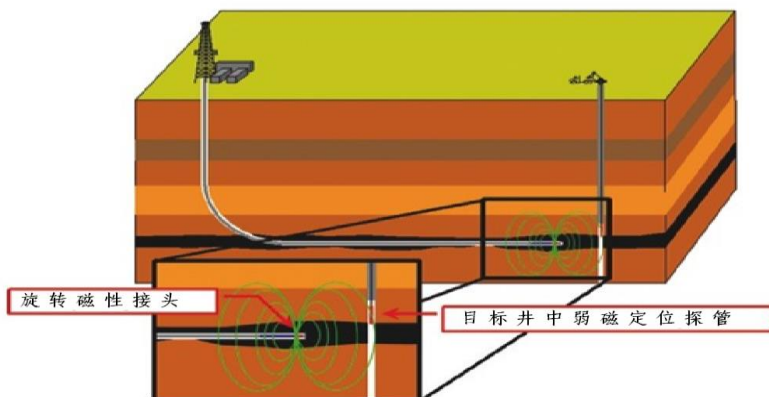
1: 120 meters to find the signal, 100 meters to guide normally

2: When the distance is greater than 70m, the distance error is less than $\pm 3\%$, and the azimuth error is less than $\pm 1^\circ$

3: When the distance is less than 30m, the distance error is less than $\pm 1\%$, and the azimuth error is less than $\pm 0.5^\circ$

Construction schematic

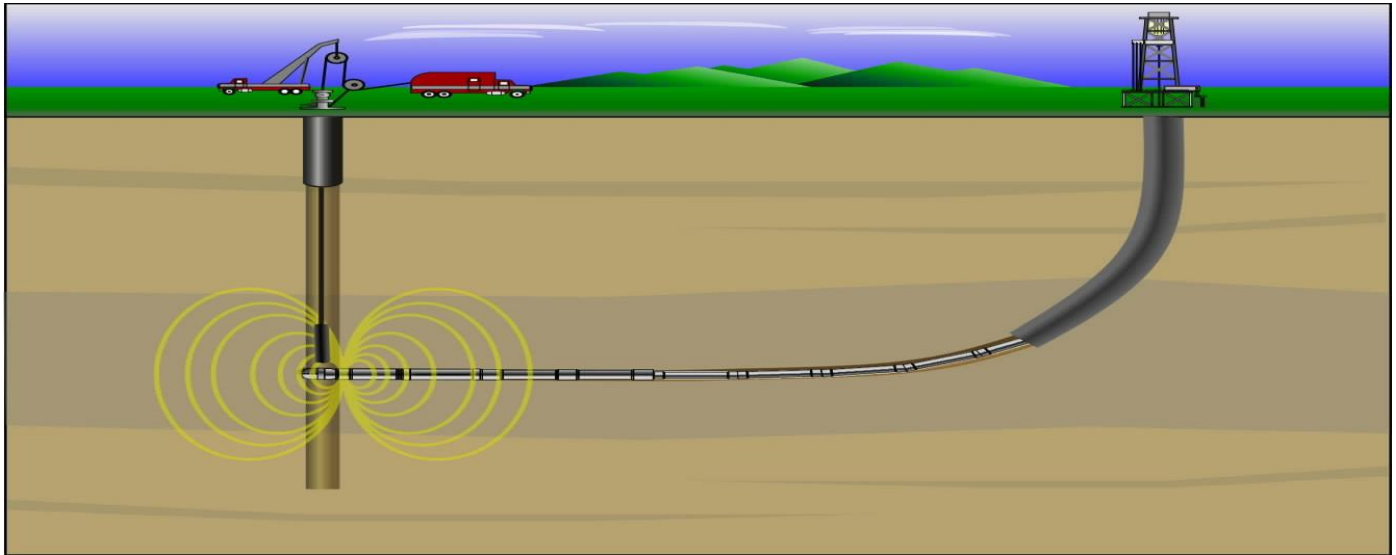
Vertical needle straight well, V-shaped inclined well, double horizontal well precision docking technology: in the recovery of old, abandoned well reproduction, coalbed methane discharge, salt well increase, geothermal well heat exchange plays a vital role.



Vertically opposite

Vertical docking

Horizontal well and straight well precision docking technology is the most common docking technology, which has been widely used in gas emissions from coalfields. C3 rotary magnetic guide vertical docking technology has been widely used in salt mine mining, geothermal mining, coal bed methane and other mining fields.



Horizontal docking

Accurate double horizontal docking technology: it solves the problem of horizontal section length (affected by the ground, unable to arrange the well position), single trajectory is not easy to control (drilling tool weight, natural sinking). This technique can be well applied to complex well conditions such as large top and bottom permeable water plugging processes. With the development of geothermal energy in order to increase the heat transfer section, more and more geothermal designs are now using dual-level docking technology



Double horizontal wear

Classic case of C3 construction

Huangling geothermal heat in Shaanxi: depth 3155, horizontal section 825, static well temperature 121 degrees Celsius, target diameter not more than 0.25 meters



Shenxian salt well: depth 2715, horizontal section 240 meters, static well temperature 109 degrees, target diameter is not more than 0.5 meters



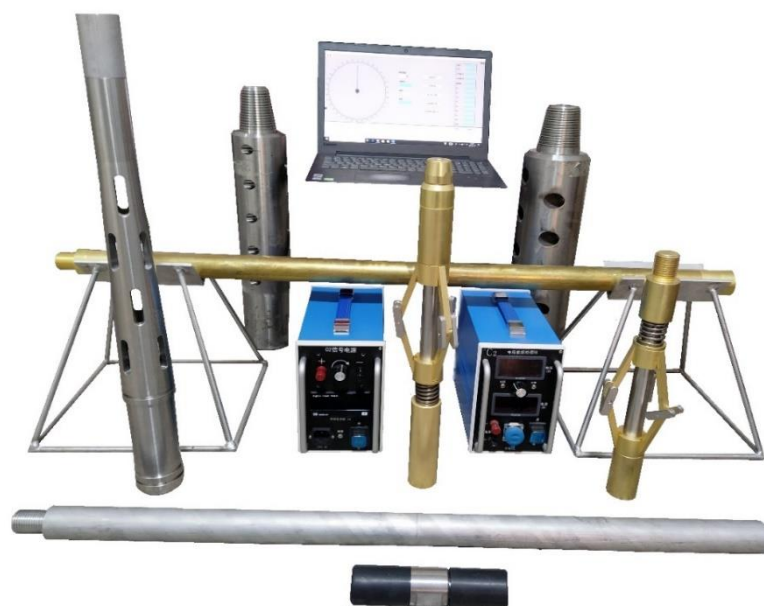
Guizhou coal-bed methane: well depth of 601, horizontal section of 980 meters, well temperature of 30 degrees, target diameter is not more than 0.5 meters



Directional drills are worn horizontally

Instrument composition

- Upper straightener
- Conversion electrode
- Probe sticks
- Lower straightener
- Extension bar
- Shunt
- Strong magnetic connector
- Dedicated data processor
- AC signal power
- Engineering computers



Instrument Introduction:

Directional drill horizontal through is the comprehensive application of C2 wired AC geomagnetic guidance instrument and C3 rotary magnetic guidance instrument, in the trenchless horizontal directional drilling through the construction of the soil entry point and excavation point at the same time construction near the designated point of communication technology.

When the construction distance between the two ends is about 100 meters, one end with a magnetic joint is drilled, the end without a magnetic joint is stationary and receives the magnetic joint signal with the instrument, and the drill bit at the one end of the magnetic joint is controlled by the stationary end instrument to control the direction of the drill at one end, and finally completes the through-line connection.

Instrument technical characteristics:

- The magnetic field positioning algorithm independently developed by C2 C3 instrument does not have the accumulated error of traditional instruments.
- In-depth error analysis and sensitivity analysis can effectively control the calculation accuracy.
- Complete digital signal processing technology can effectively suppress noise interference, accurately extract signal characteristics, and transmit more than 5 kilometers of signal transmission distance.
- The temperature resistance, shock resistance and stability of the instrument are produced according to petroleum standards

Directional drills are worn horizontally

Inclinometer range and accuracy:

Inclination: $0\sim 180^\circ$, $\pm 0.1^\circ$

Azimuth: $0\sim 360^\circ$, $\pm 0.3^\circ$

Tool face: $0\sim 360^\circ$, $\pm 0.5^\circ$

Signal transmission distance: more than 5,000 meters

working conditions:

Operating temperature: $-20\sim +125^\circ\text{C}$

Maximum pressure resistance: 100Mpa

Wireframe positioning accuracy:

The left and right errors are less than 0.5% of the wireframe width and the up-down errors are less than 1% of the wireframe width.

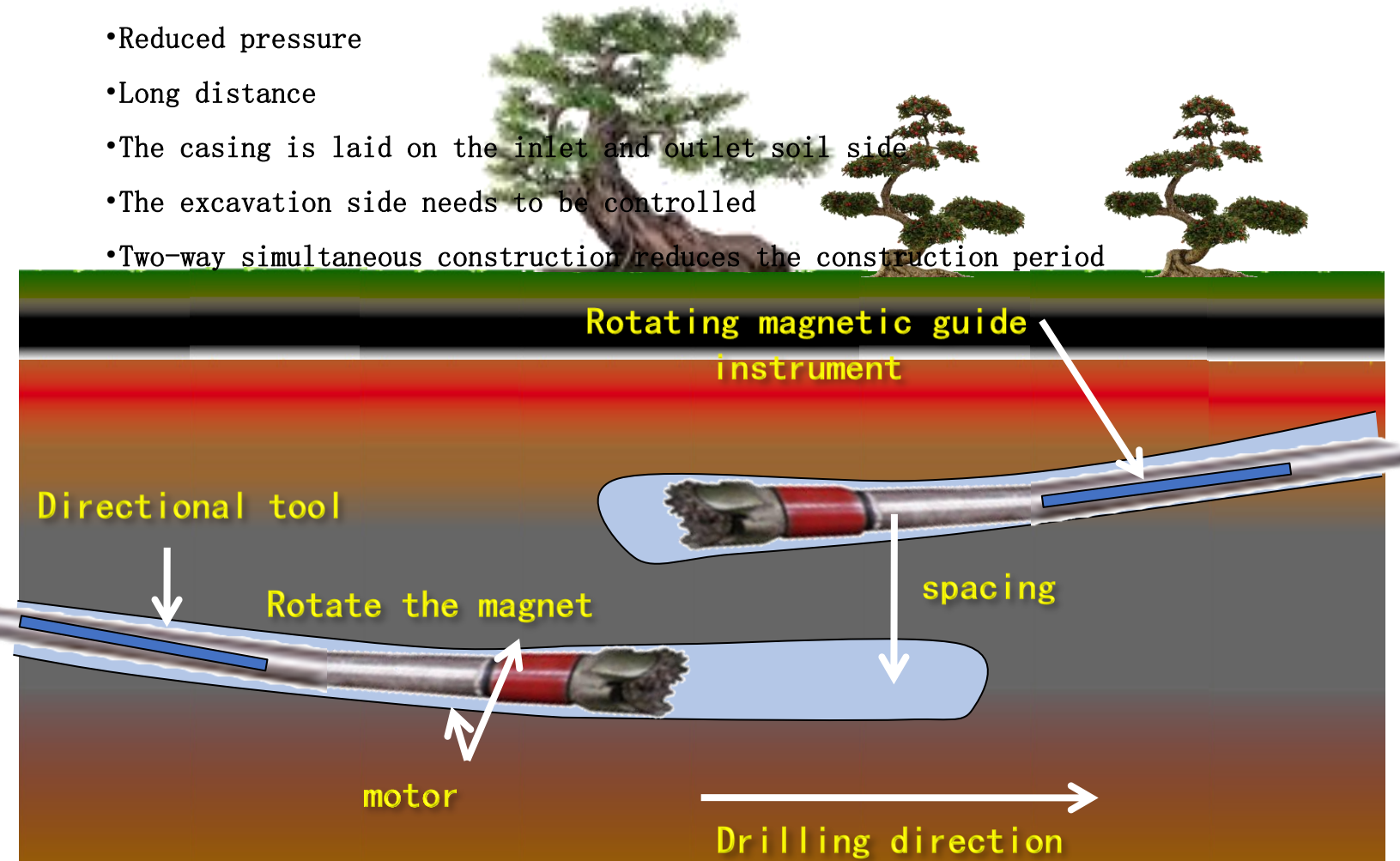
Rotational magnetic guide positioning accuracy:

When the distance is greater than 70m, the distance error is less than $\pm 3\%$, and the azimuth error is less than $\pm 1^\circ$

When the distance is less than 30m, the distance error is less than $\pm 1\%$, and the azimuth error is less than $\pm 0.5^\circ$

Under what circumstances is it advantageous to wear?

- Reduced pressure
- Long distance
- The casing is laid on the inlet and outlet soil side
- The excavation side needs to be controlled
- Two-way simultaneous construction reduces the construction period



Construction schematic



The Changshan River in Quzhou, Zhejiang Province, is horizontally crossed, and the two ends of the cobblestone formation need to be rammed, with a total length of more than 900 meters



C4 MTGS (Cross magnetic target)

Instrument composition

- Support base
- A, B removable magnetic rod
- Signal generation controller
- Dedicated construction C4 software



Instrument Introduction:

In order to solve the problem of non-excavation horizontal directional drilling in the construction of the wireframe, as well as the problem of inconvenient arrangement of wireframe in special construction occasions (such as crossing the river, crossing the river, etc.), and accelerate the progress of non-excavation to improve the construction efficiency, our company independently developed the cross-cross magnetic target system, which will generate an AC signal after the magnetic target system is energized, and the space around the magnetic target will form a specific regular magnetic field distribution. The precise positioning between the drill bit and the magnetic target is judged by the C2 AC geomagnetic guide instrument mounted on the drill bit receiving the signal generated by the magnetic target

Instrument technical features:

- Instrument accuracy: the error is less than 1% of the actual position distance.
- The instrument operating temperature is -20°C to $+85^{\circ}\text{C}$
- The effective construction depth is not less than 60 meters

SC4 MTGS (Single magnetic target)

Instrument composition

- Support the triangular base
- Portable single magnetic rod
- Signal generator
- Dedicated construction SC4 software



Instrument Introduction:

SC4 MTGS word magnetic target is to solve the trenchless horizontal directional drilling guide hole construction and research and development of portable guidance instrument is lighter than the cross magnetic target, the effective construction depth is not less than 60 meters, greatly improving the flexibility and mobility of construction, especially in mountains, rivers, swamps and other places where wireframes can not be arranged, the magnetic target system will produce an AC signal after powering on, and the space around the magnetic target will form a specific regular magnetic field distribution. By the geomagnetic guide instrument mounted on the drill bit to receive the signal generated by the magnetic target to determine the relative position between the drill bit and the magnetic target, the SC4 instrument in addition to the ground guidance function also supports the underground long-distance horizontal through function.

Instrument technical features:

- Instrument accuracy: the error is less than 1% of the actual position distance.
- The instrument operating temperature is -20°C to $+85^{\circ}\text{C}$
- It has the function of horizontal piercing construction

Patented technology

证书号第13578202号



实用新型专利证书

实用新型名称：一种非开挖地磁导向仪器扶正器

发明人：袁世佳

专利号：ZL 2020 2 2251811.2

专利申请日：2020年10月12日

专利权人：河北韶通翱达科技有限公司

地址：065201 河北省廊坊市三河市燕郊开发区燕顺路东侧、甜城一期E区一期1号楼1-1-1603

授权公告日：2021年07月02日 授权公告号：CN 213597899 U

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局长 申长雨



第1页(共2页)

证书号第16629506号



实用新型专利证书

实用新型名称：一种可变磁矩旋转磁接头

发明人：袁世佳

专利号：ZL 2022 2 0103005.7

专利申请日：2022年01月17日

专利权人：河北韶通翱达科技有限公司

地址：065201 河北省廊坊市三河市燕郊开发区燕顺路东侧、甜城一期E区一期1号楼1-1-1603

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局长 申长雨



第1页(共2页)

证书号第11675821号



实用新型专利证书

实用新型名称：一种非开挖井下导向系统

发明人：袁世佳

专利号：ZL 2020 2 0126780.5

专利申请日：2020年01月19日

专利权人：河北韶通翱达科技有限公司

地址：065201 河北省廊坊市三河市燕郊开发区燕顺路东侧、甜城一期E区一期1号楼1-1-1603

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证书号：软著登字第5141625号

软件名称：C2交流穿越导向系统
[简称：C2]
V1.9.1.1

著作权人：河北韶通翱达科技有限公司

开发完成日期：2019年06月08日

首次发表日期：未发表

权利取得方式：原始取得

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登记号：2020SR0262930

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No. 05459008
2020年09月17日

Key technologies

Patented technology

