

DTH DRILLING PRODUCTS 潜孔钻具





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企业简介

COMPANY INTRODUCTION

郑州高德机械设备有限公司是一家从事高气压潜孔凿岩钻具研发和制造的专业性公司。自1995年建厂以来，公司投资数亿元建立了世界先进水平的潜孔钻具生产系统。有国际一流的电液锻造、金加工、热处理及数控中心等完备的生产流水线。先进数控装备广泛使用在生产工艺全过程，严格准确把握各个质量控制点，为制造世界顶级潜孔钻具奠定了良好基础。

术业有专攻” 郑州高德全体同仁以超前理念，执着于高气压潜孔钻具，共同创造了多项顶尖制造工艺，生产产品完全拥有自主知识产权。素质精良研发和生产团队在激烈市场竞争中不断优化产品结构，推出市场所需的优质产品，并跻身国际专业制造前列。

公司专业生产和销售高、中、低气压潜孔钻头、冲击器，API系列钻管、同心偏心跟管钻具及顶锤式液压钻机用的螺纹球齿钻头、连接套、钎尾。所有的产品都能与瑞典阿特拉斯(Atlas Copco)、山特维克(Sandvik)、美国英格索兰(Ingersoll-Rand及世界其他品牌制造公司的产品相配套，广泛应用于岩石爆破孔、矿山开采，土石方、水井和建筑基础等工程施工。

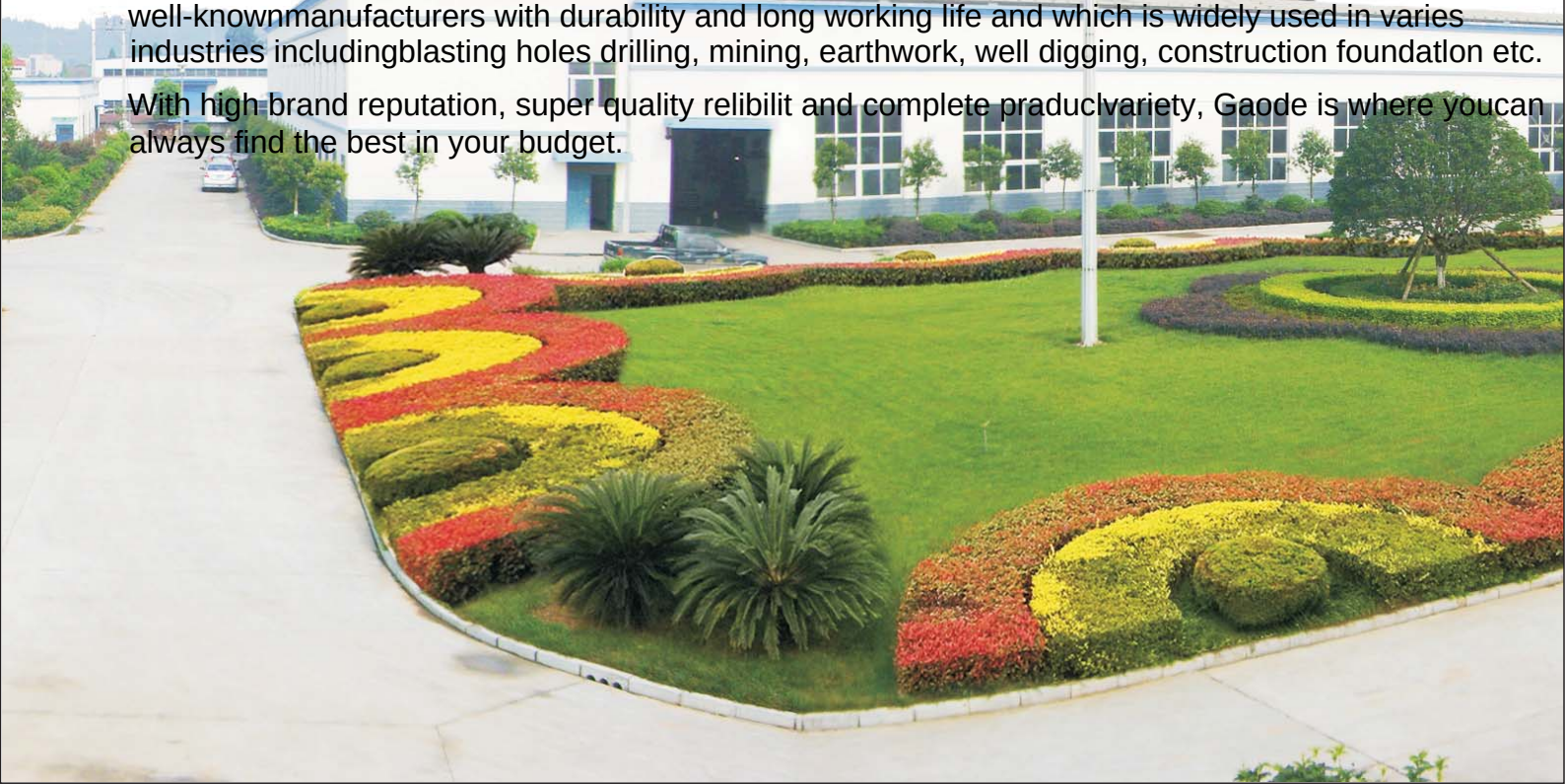
本公司凿岩钻具品牌可信、质量可靠，产品种类齐全，在这里总可以找到适合您的产品！

Gaode Equipment Co., Ltd. is one of the most specialized high-air-pressure DTH drilling equipments developers and manufacturers in China. Since 1995, hundreds millions of dollar have been invested to build an advanced manufacturing system. The factory is equipped with electro-hydraulic forging machines, metal processing plant, heat treatment workshop, numerical control machines etc, which compose a complete production line. CNC machines are largely used in the whole manufacturing process to insure every critical control point of quality. All these elements have guaranteed a professional hardware foundation and an excellent outcome of world class DTH products.

"To be a master in his own field", the whole Gaode people have much co-created numbers of top manufacturing technology for producing high air pressure DTH products with independent intellectual property, A group of qualified researchers and skilled technicians commit themselves to a constantly optimised product structure, to develop high quality products meeting up with the market demand and to fulfill the goal of ranking among the field forefront worldwide.

Manufacturing and supplying a variety range of high, medium and low air pressure hammer and bit, API thread drill pipe, eccentric & symmetric casing system and hydraulic top hammer products including tapered button bit, coupling sleeve, shank adapter etc, Gaode make products which is perfectly compatible with the famous brand such as Atlas Copco, Ingersoll-Rand, Sandvik and other well-known manufacturers with durability and long working life and which is widely used in various industries including blasting holes drilling, mining, earthwork, well digging, construction foundation etc.

With high brand reputation, super quality reliability and complete product variety, Gaode is where you can always find the best in your budget.





▲ 技术研发中心
Technology research and Development Center



▲ 意大利吉埃斐公司生产热处理生产线
Italy Ji Aifei produced heat treatment production line



▲ 现代高档数控生产线(金加工)
Modern CNC production lines (metal processing)



◀ 技术交流
Technology Exchange



◀ 产品研究
Product Research



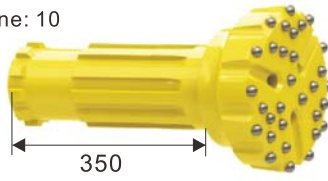
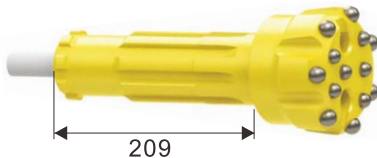
◀ 外商回访
Foreign visits



◀ 现场服务
Field Service

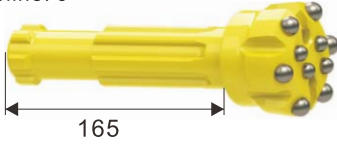
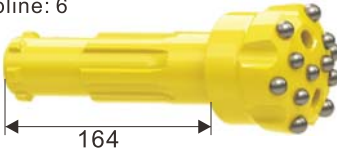
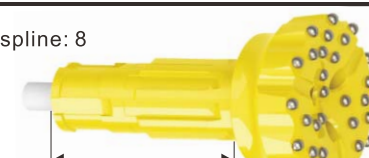
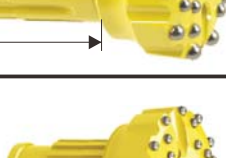
钻头尾柄说明

Bit shanks indentification chart

花键数spline: 6  2.5N 174  CWG76 174	花键数spline: 10  380N 350  DHD380 350
花键数spline: 8  3.5N 180  DHD3.5 180	花键数spline: 12  DHD110 396 花键数spline: 8  Mission 30 224
花键数spline: 8  340N 209  DHD340A, IR4, Secoroc COP44 209	花键数spline: 12  Mission 40 228 花键数spline: 12  Mission 50 260
花键数spline: 8  350N 260  DHD350R Secoroc COP54 260	花键数spline: 12  Mission 60 231 花键数spline: 12  Mission 80 329 mm
花键数spline: 8  360N 309  DHD360, IR SF6, Secoroc COP64 309	花键数spline: 8  Mach33 170 花键数spline: 8  Mach44 180

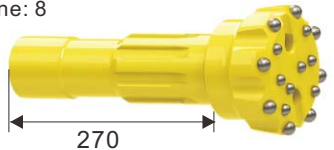
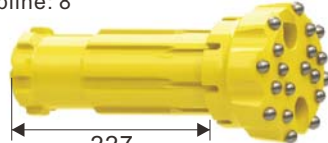
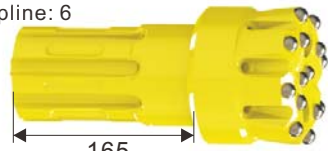
钻头尾柄说明

Bit shanks indentification chart

花键数spline: 8  260 SD4	花键数spline: 6  165 BR2
花键数spline: 8  260 SD5	花键数spline: 6  164 BR3
花键数spline: 8  324 SD6	花键数spline: 12  209 BR4
花键数spline: 8  321 SD8	花键数spline: 6  130 Wooke30
花键数spline: 10  280 QL40	花键数spline: 8  141 Wooke40
花键数spline: 12  240 QL50	花键数spline: 8  170 Wooke50
花键数spline: 12  253 QL60	花键数spline: 10  200 Wooke60
花键数spline: 16  332 QL80	花键数spline: 16  220 Wooke80
花键数spline: 10  210 MD4	52  II-110P(俄)
花键数spline: 12  220 MC80	60  II-130P(俄)

钻头尾柄说明

Bit shanks indentification chart

花键数spline: 8  COP34 245	花键数spline: 8  COPROD76 348
花键数spline: 12  TD40 209	花键数spline: 8  COPROD89 384
花键数spline: 8  COP32 215	花键数spline: 7  COPROD102 388
花键数spline: 7  COP42 190	花键数spline: 8  COPROD127 396
花键数spline: 8  COP52 270	花键数spline: 8  RC50 227
花键数spline: 9  COP62 265	花键数spline: 6  FZT140 165

钻头头部形状与选型 Bit head design and selection



平面球齿型
Flat front
Spherical

适用钻凿硬岩，坚硬岩石及磨蚀性强岩层。
Applications:
For drilling in hard and abrasive rock.



平面边球中尖型
Flat front
Spherical+Ballistic

适用钻凿中硬岩，硬岩及中等磨蚀性岩石。
Applications:
For drilling in medium-hard to hard and moderately abrasive rock.



凸面边球中尖型
Convex front
Spherical+Ballistic

适用中硬岩及磨蚀性中等岩层。
Applications:
For drilling in medium-hard and moderately abrasive rock.



凸面全尖型
Convex front
Ballistic

适用非磨蚀性岩层的高速钻凿。
Applications:
For drilling at high penetration rates in non abrasive rock.



凹面球齿型
Concave front
Spherical

适用中硬岩，并有很小钻孔偏差。
Applications:
For drilling in medium-hard, minimum hole deviation control.

有尾管 高气压潜孔冲击器系列

一种快冲[®](专利)结构设计——快速、节能、可靠

High Air Pressure DTH Hammer Series (With Foot Valve)

TND[®](Patent)Advanced Structure Design—Fast,Reliable,Energy-saving

● 为了延长钻凿高腐蚀性岩石时外套管使用寿命，后接头有三件套式，可及时更换耐磨套。

In order to increase working life of the piston case when drilling very abrasive rocks,the driver sub is designed to be made up of three pieces and only the wear-proof casing need to be replaced timely.

● 经热处理硬化实体活塞与内缸导向结构合理,能达到最高效率和产生很高冲击功，比相同规格提高钻速10~30%。

Heat treated piston and internal cylinder guiding system are reasonably structured to achieve the highest efficiency and the largest impacting power.The penetration speed is 10%-30% faster than other products of the same type.

● 快冲[®]结构优化设计：内缸进风孔少，气槽刚性强，不易损坏。

TND[®]optimized structure design:Fewer air holes on internal cylinder,higher stiffness of air slot.

● 采用数控加工方法解决了多头螺纹旋合导向问题，使得钻头上机工作简单方便。前接头表面进行硬化处理，更耐磨，寿命更长。

The multiple threads are CNC machined to achieve high-accuracy,Making the bit easy and smooth to get assembled.Driver sub is heat treated to achieve better abrasiveness and longer life.

● 标准API螺纹

Standard API Thread

● 后接头有合金切削柱齿(供选择)。

Top sub with cement carbide button(Alternative).

● 内部零件牢固地装配成一体，消除了相互磨损并增加可靠性。

Internal parts are tightly assembled to avoid interactive wear and hammer's reliability is increased.

● 外套管选用优质合金钢，热处理后工作寿命长，可靠性好。

Piston case: Using superior alloy steel,even better reliability and longer life after heat treatment.

● 前段结构设计，使得冲击器提杆时，活塞最后冲击落在外套管止台阶上，前接头花键和卡环更安全。

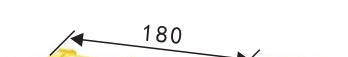
Hammer front structure design: when pulling out the hammer,the last impact of the piston would fall on the step of piston case,ensuring the safety of the driver sub splines and the retainer ring.



High Air Pressure DTH Hammers(with foot valve)

Exploded view diagram of a hydraulic cylinder assembly. The components are numbered 01 through 13:

- 01: Piston rod with a yellow seal ring.
- 02: O-ring.
- 03: Piston pin.
- 04: Piston pin spring.
- 05: Piston pin bush.
- 06: Piston pin nut.
- 07: O-ring.
- 08: Piston rod with a yellow seal ring.
- 09: Piston rod with a yellow seal ring.
- 10: Piston rod with a yellow seal ring.
- 11: Piston pin bush.
- 12: O-ring.
- 13: Piston rod with a yellow seal ring.

钻头尾柄 Bit shank	
DHD3.5	
钻头直径 Bit dia	
90; 100; 105	八花键 8 splines

8

有尾管高压潜孔冲击器

High Air Pressure DTH Hammers(with foot valve)

Hammer Model	Suitable Drill Bit			
快冲-SD4 TND-SD4	钻头尾柄 Bit Shank	 八花键 8 splines		
	QL40			
	钻头直径 Bit Dia			
	108;115; 121; 127;130			
重量Weight (kg)	外径Outer Diameter (mm)	冲击器有效长度Hammer Length without bit (mm)		
39	99	932		
钻孔范围 Hole Range	适用气压 work pressure	耗气量Air consumption,m3/min		
mm	bar	10bar	18bar	24bar
Φ105-Φ130	8-30	5	10.2	15
Hammer Model	Suitable Drill Bit			
快冲-IR350 TND-IR350	钻头尾柄 Bit Shank	 八花键 8 splines		
	DHD350R			
	钻头直径 Bit Dia			
	140;148; 152			
重量Weight (kg)	外径Outer Diameter (mm)	冲击器有效长度Hammer Length without bit (mm)		
74	126	992		
钻孔范围 Hole Range	适用气压 work pressure	耗气量Air consumption,m3/min		
mm	bar	10bar	18bar	24bar
Φ133-Φ152	8-30	7.5	14.7	19.5

有尾管高压潜孔冲击器

High Air Pressure DTH Hammers(with foot valve)

Hammer Model	Suitable Drill Bit	 十二花键 12 splines		
快冲-QL50 TND-QL50	钻头尾柄 Bit Shank			
	QL50			
	钻头直径 Bit Dia			
	140;148; 152			
重量Weight (kg)	外径Outer Diameter (mm)	冲击器有效长度Hammer Length without bit (mm)		
74	126	972		
钻孔范围 Hole Range	适用气压 work pressure	耗气量Air consumption,m3/min		
mm	bar	10bar	18bar	24bar
Φ133-Φ152	8-30	7.5	14.7	19.5

Hammer Model	Suitable Drill Bit	 八花键 8 splines		
快冲-SD5 TND-SD5	钻头尾柄 Bit Shank			
	SD5			
	钻头直径 Bit Dia			
	140;148; 152			
重量Weight (kg)	外径Outer Diameter (mm)	冲击器有效长度Hammer Length without bit (mm)		
74	126	1043		
钻孔范围 Hole Range	适用气压 work pressure	耗气量Air consumption,m3/min		
mm	bar	10bar	18bar	24bar
Φ133-Φ152	8-30	7.5	14.7	19.5

有尾管高压潜孔冲击器

High Air Pressure DTH Hammers(with foot valve)

Hammer Model	Suitable Drill Bit	 309 八花键 8 splines		
快冲-IR360 TND-IR360	钻头尾柄 Bit Shank			
	DHD360			
	钻头直径 Bit Dia			
	155;159; 165;178;190; 203			
重量Weight (kg)	外径Outer Diameter (mm)	冲击器有效长度Hammer Length without bit (mm)		
112	144	1135		
钻孔范围 Hole Range	适用气压 work pressure	耗气量Air consumption,m3/min		
mm	bar	10bar	18bar	24bar
Φ152-Φ254	8-30	8.7	14.5	25
Hammer Model	Suitable Drill Bit	 253 十二花键 12 splines		
快冲-QL60 TND-QL60	钻头尾柄 Bit Shank			
	QL60			
	钻头直径 Bit Dia			
	155;159;165;178;190; 203			
重量Weight (kg)	外径Outer Diameter (mm)	冲击器有效长度Hammer Length without bit (mm)		
112	144	1080		
钻孔范围 Hole Range	适用气压 work pressure	耗气量Air consumption,m3/min		
mm	bar	10bar	18bar	24bar
Φ152-Φ254	8-30	8.7	14.5	25

有尾管高压潜孔冲击器

High Air Pressure DTH Hammers(with foot valve)

Hammer Model	Suitable Drill Bit	 八花键 8 splines		
快冲-SD6 TND-SD6	钻头尾柄 Bit Shank			
	SD6			
	钻头直径 Bit Dia			
	155;159;165;178;190; 203			
重量Weight (kg)	外径Outer Diameter (mm)	冲击器有效长度Hammer Length without bit (mm)		
113	144	1150		
钻孔范围 Hole Range	适用气压 work pressure	耗气量Air consumption,m3/min		
mm	bar	10bar	18bar	24bar
Φ152-Φ254	8-30	8.7	14.5	25
Hammer Model	Suitable Drill Bit	 十花键 10 splines		
快冲-IR380 TND-IR380	钻头尾柄 Bit Shank			
	DHD380			
	钻头直径 Bit Dia			
	194;203;216;219;222; 254;270;305			
重量Weight (kg)	外径Outer Diameter (mm)	冲击器有效长度Hammer Length without bit (mm)		
180	182	1228		
钻孔范围 Hole Range	适用气压 work pressure	耗气量Air consumption,m3/min		
mm	bar	10bar	18bar	24bar
Φ194-Φ305	8-30	12	26	35

有尾管高压潜孔冲击器

High Air Pressure DTH Hammers(with foot valve)

Hammer Model	Suitable Drill Bit	 十六花键 16 splines		
快冲-QL80 TND-QL80	钻头尾柄 Bit Shank			
	QL80			
	钻头直径 Bit Dia			
	194;203;216;219;222; 254;270;305			
重量Weight (kg)	外径Outer Diameter (mm)	冲击器有效长度Hammer Length without bit (mm)		
182	182	1221		
钻孔范围 Hole Range	适用气压 work pressure	耗气量Air consumption,m3/min		
mm	bar	10bar	18bar	24bar
Φ194-Φ305	8-30	12	26	35
Hammer Model	Suitable Drill Bit	 八花键 8 splines		
快冲-SD8 TND-SD8	钻头尾柄 Bit Shank			
	SD8			
	钻头直径 Bit Dia			
	194;203;216;219;222; 254;270;305			
重量Weight (kg)	外径Outer Diameter (mm)	冲击器有效长度Hammer Length without bit (mm)		
182	182	1199		
钻孔范围 Hole Range	适用气压 work pressure	耗气量Air consumption,m3/min		
mm	bar	10bar	18bar	24bar
Φ194-Φ305	8-30	12	26	35

无尾管 高气压潜孔冲击器系列

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Standard API Thread

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Top sub with cement carbide button(Alternative).

● 经热处理硬化实体活塞与内缸导向结构合理,能达到最高效率和产生很高冲击功,比相同规格提高钻速10~30%。

Heat treated piston and internal cylinder guiding system are reasonably structured to achieve the highest efficiency and the largest impacting power.The penetration speed is 10%-30% faster than other products of the same type.

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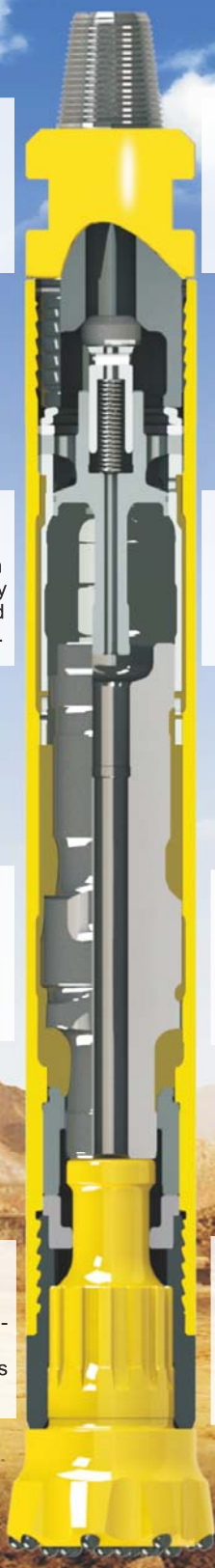
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● 前段结构设计，使得冲击器提杆时，活塞最后冲击落在外套管止台阶上，前接头花键和卡环更安全。

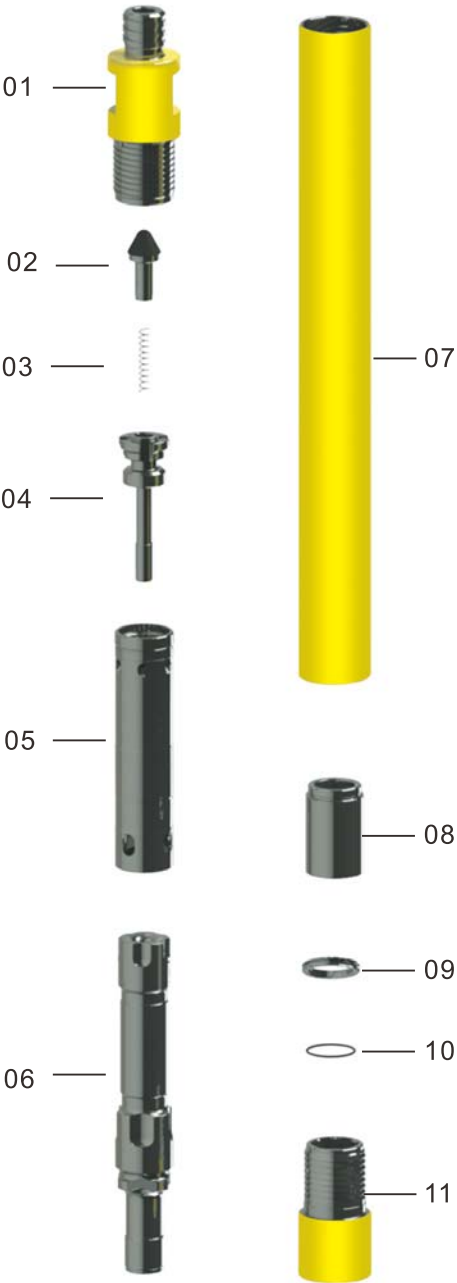
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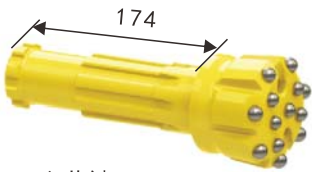


无尾管高压潜孔冲击器

High Air Pressure DTH Hammers(without foot valve)

快冲[®]-2.5N/ TND[®]-2.5N



部件Replancement Parts	单重Weight(kg)	件号Part No.
01 后接头 T42X10X2	3.34	TND-HJT-2.5
02 逆止阀 Check Valve Dart	0.10	TND-NZF-2.5
03 弹簧 Spring	0.02	TH-2.5
04 配气杆 Rigid Valve	0.45	TND-PQG-2.5
05 内缸 Internal Cylinder	0.97	TND-NG-2.5
06 活塞 Piston	4.00	TND-HS-2.5N
07 外套管 Piston Case	5.96	TND-WTG-2.5N
08 导向套 Guide Sleeve	0.55	TND-DXT-2.5N
09 卡环 Bit Retainer Ring	0.06	TND-KH-2.5
10 O型圈 O-Ring	0.01	O-KH-2.5
11 前接头 Driver Sub	1.74	TND-QJT-2.5
密封件 Seal Kit 10 × 1	0.01	SK-2.5N
易耗件 Consumable 01 × 1 07 × 1 11 × 1 密封件 Seal Kit	11.05	CSB-2.5N
钻头尾柄 Bit shank CWG76N 钻头直径 Bit dia 78	 六花键 6 splines	

重量Weight(kg)	外径Outside diameter(mm)	冲击器有效长度Hammer length without bit (mm)		
17.5	70	806		
钻孔范围Hole Range	适用气压Work Pressure	耗气量Air consumption,m3/min		
mm	bar	10bar	18bar	24bar
Φ76-Φ80	8-24	2	4	6

无尾管高压潜孔冲击器

High Air Pressure DTH Hammers(without foot valve)

Hammer Model	Suitable Drill Bit	 180 八花键 8 splines		
快冲-3.5N TND-3.5N	钻头尾柄 Bit Shank			
	3.5N			
	钻头直径 Bit Dia			
	90;100			
重量Weight (kg)	外径Outer Diameter (mm)	冲击器有效长度Hammer Length without bit (mm)		
24.5	80	863		
钻孔范围 Hole Range	适用气压 work pressure	耗气量Air consumption,m3/min		
mm	bar	10bar	18bar	24bar
Φ90-Φ105	8-24	3.8	8	11.5

Hammer Model	Suitable Drill Bit	 224 八花键 8 splines		
快冲-M30 TND-M30	钻头尾柄 Bit Shank			
	Mission30			
	钻头直径 Bit Dia			
	90;100			
重量Weight (kg)	外径Outer Diameter (mm)	冲击器有效长度Hammer Length without bit (mm)		
23	80	909		
钻孔范围 Hole Range	适用气压 work pressure	耗气量Air consumption,m3/min		
mm	bar	10bar	18bar	24bar
Φ105-Φ130	8-24	3.8	8	11.5

无尾管高压潜孔冲击器

High Air Pressure DTH Hammers(without foot valve)

Hammer Model	Suitable Drill Bit			
快冲-340N TND-340N	钻头尾柄 Bit Shank	 八花键 8 splines		
	340N			
	钻头直径 Bit Dia			
	108;115; 121; 127;130			
重量Weight (kg)	外径Outer Diameter (mm)	冲击器有效长度Hammer Length without bit (mm)		
40.5	99	936		
钻孔范围 Hole Range	适用气压 work pressure	耗气量Air consumption,m3/min		
mm	bar	10bar	18bar	24bar
Φ105-Φ130	8-30	4.5	9	14
Hammer Model	Suitable Drill Bit			
快冲-M40 TND-M40	钻头尾柄 Bit Shank	 十二花键 12 splines		
	Mission40			
	钻头直径 Bit Dia			
	108;115; 121; 127;130			
重量Weight (kg)	外径Outer Diameter (mm)	冲击器有效长度Hammer Length without bit (mm)		
41	99	955		
钻孔范围 Hole Range	适用气压 work pressure	耗气量Air consumption,m3/min		
mm	bar	10bar	18bar	24bar
Φ105-Φ130	8-30	4.5	9	14

无尾管高压潜孔冲击器

High Air Pressure DTH Hammers(without foot valve)

Hammer Model	Suitable Drill Bit
快冲-350N TND-350N	钻头尾柄 Bit Shank
	350N
	钻头直径 Bit Dia
	140;148; 152



重量Weight (kg)	外径Outer Diameter (mm)	冲击器有效长度Hammer Length without bit (mm)		
74	126	1045		
钻孔范围 Hole Range	适用气压 work pressure	耗气量Air consumption,m3/min		
mm	bar	10bar	18bar	24bar
Φ133-Φ152	8-30	6.5	12.5	17

Hammer Model	Suitable Drill Bit
快冲-M50 TND-M50	钻头尾柄 Bit Shank
	Mission50
	钻头直径 Bit Dia
	140;148; 152



重量Weight (kg)	外径Outer Diameter (mm)	冲击器有效长度Hammer Length without bit (mm)		
74	126	1045		
钻孔范围 Hole Range	适用气压 work pressure	耗气量Air consumption,m3/min		
mm	bar	10bar	18bar	24bar
Φ133-Φ152	8-30	6.5	12.5	17

无尾管高气压潜孔冲击器

High Air Pressure DTH Hammers(without foot valve)

Hammer Model	Suitable Drill Bit
快冲-QL50N TND-QL50N	钻头尾柄 Bit Shank
	QL50N
	钻头直径 Bit Dia
	140;148; 152



重量Weight (kg)	外径Outer Diameter (mm)	冲击器有效长度Hammer Length without bit (mm)		
73	126	1025		
钻孔范围 Hole Range	适用气压 work pressure	耗气量Air consumption,m3/min		
mm	bar	10bar	18bar	24bar
Φ133-Φ152	8-30	6.5	12.5	17

Hammer Model	Suitable Drill Bit
快冲-360N TND-360N	钻头尾柄 Bit Shank
	TND-360N
	钻头直径 Bit Dia
	155;159;165;178;190; 203



重量Weight (kg)	外径Outer Diameter (mm)	冲击器有效长度Hammer Length without bit (mm)		
106	144	1187		
钻孔范围 Hole Range	适用气压 work pressure	耗气量Air consumption,m3/min		
mm	bar	10bar	18bar	24bar
Φ152-Φ254	8-30	7.5	16	24

无尾管高压潜孔冲击器

High Air Pressure DTH Hammers(without foot valve)

Hammer Model	Suitable Drill Bit	 十二花键 12 splines		
快冲-M60 TND-M60	钻头尾柄 Bit Shank			
	Mission60			
	钻头直径 Bit Dia			
	155;159;165;178;190;203			
重量Weight (kg)	外径Outer Diameter (mm)	冲击器有效长度Hammer Length without bit (mm)		
105	144	1108		
钻孔范围 Hole Range	适用气压 work pressure	耗气量Air consumption,m3/min		
mm	bar	10bar	18bar	24bar
Φ152-Φ254	8-30	7.5	16	24
Hammer Model	Suitable Drill Bit	 十二花键 12 splines		
快冲-QL60N TND-QL60N	钻头尾柄 Bit Shank			
	QL60N			
	钻头直径 Bit Dia			
	155;159; 165;178;190;203			
重量Weight (kg)	外径Outer Diameter (mm)	冲击器有效长度Hammer Length without bit (mm)		
108	144	1131		
钻孔范围 Hole Range	适用气压 work pressure	耗气量Air consumption,m3/min		
mm	bar	10bar	18bar	24bar
Φ152-Φ254	8-30	7.5	16	24

无尾管高压潜孔冲击器

High Air Pressure DTH Hammers(without foot valve)

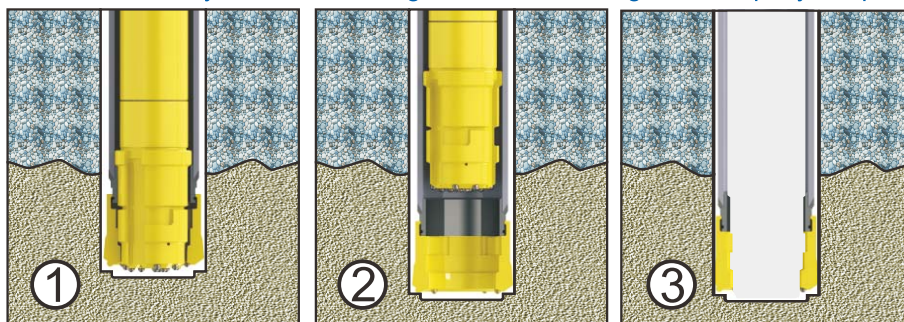
Hammer Model	Suitable Drill Bit	 十花键 10 splines		
快冲-380N TND-380N	钻头尾柄 Bit Shank			
	380N			
	钻头直径 Bit Dia			
	194;203;216;219;222; 254;270;305			
重量Weight (kg)	外径Outer Diameter (mm)	冲击器有效长度Hammer Length without bit (mm)		
195	182	1318		
钻孔范围 Hole Range	适用气压 work pressure	耗气量Air consumption,m3/min		
mm	bar	10bar	18bar	24bar
Φ194-Φ305	8-30	10	24	33
Hammer Model	Suitable Drill Bit	 八花键 8 splines		
快冲-M80 TND-M80	钻头尾柄 Bit Shank			
	Mission80			
	钻头直径 Bit Dia			
	194;203;216;219			
重量Weight (kg)	外径Outer Diameter (mm)	冲击器有效长度Hammer Length without bit (mm)		
182	182	1199		
钻孔范围 Hole Range	适用气压 Work pressure	耗气量Air consumption,m3/min		
mm	bar	10bar	18bar	24bar
Φ194-Φ305	8-30	10	24	33

同心跟管钻具

Symmetric Drilling Tools with casing tube

•可回收同心跟管钻具钻进步骤

Retrievable Symmetric Drilling tools with casing tube step-by-step



1. 开始工作时, 中心钻头带动环形钻头向下钻进, 同时也带动管靴和跟管向下跟进。

When the drilling starts, the central bit drive the ring bit down the hole, meanwhile the casing shoe and casing tube follow down together.

2. 到达基岩时, 反转钻头, 将中心钻头从孔中提出, 环形钻头留在孔底。

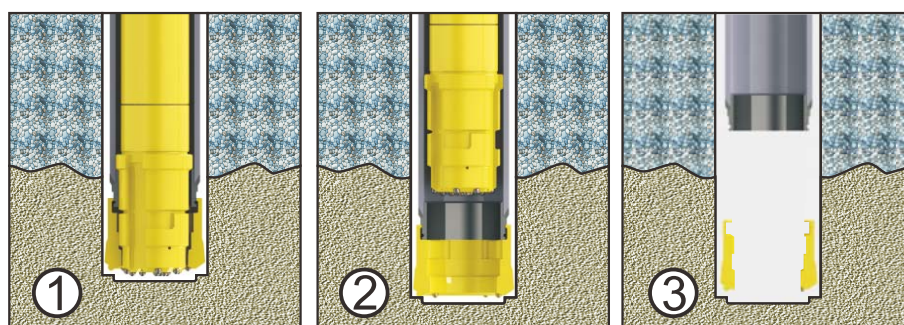
When arriving the bedrock, reversly rotate the tools and the central bit is pulled out from the hole.

3. 边注浆边将跟管连同环形钻头从底部拔出。

During pouring the concretes through the casing tube, pull out the casing tube with the ring bit synchroly.

• 不可回收同心跟管钻具钻进步骤

Permanent Symmetric Drilling tools with casing tube step-by-step



1. 开始工作时, 中心钻头带动环形钻头向下钻进, 同时也带动管靴和跟管向下跟进。

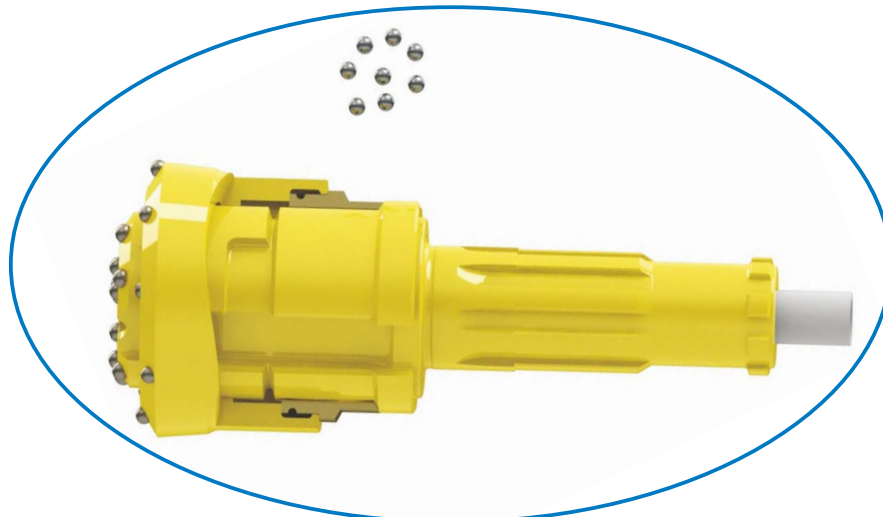
When the drilling starts, the central bit drive the ring bit down the hole, meanwhile the casing shoe and casing tube follow down together.

2. 到达基岩时, 反转钻头, 将中心钻头从孔中提出, 环形钻头留在孔底。

When arriving the bedrock, reversly rotate the tools and the central bit is pulled out while leaving ring bit in the hole bottom.

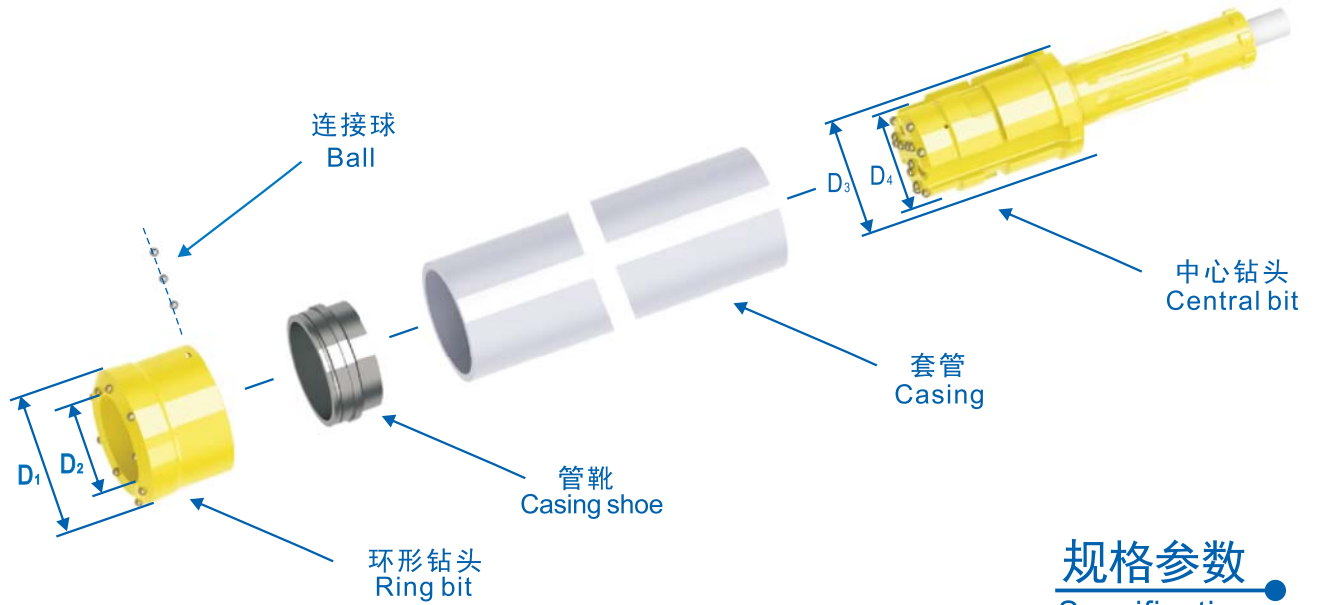
3. 直接注浆或者进行下一步施工。

Pouring the concretes into the casing tube or move to next filed work process.



同心跟管钻具

Symmetric Drilling Tools with casing tube



规格参数

Specification

总成代号 Assembly Code	套管 Casing tube		环形钻头 Ring bit		中心钻头 Central bit		配套冲击器 Hammer	钻杆 Drill pipe dia. (mm)
	外径 Outside dia. (mm)	最大壁厚 Wall thickness (mm)	D ₁ (mm)	D ₂ (mm)	D ₃ (mm)	D ₄ (mm)		
TGZ75-3.5-108/7.5	108	7.5	118	77	91	75	DHD3.5	76
TGZ80-3.5-114/6	114	6	127	88	100	80	DHD3.5	76
TGZ90-3.5-127/6.5	127	6.5	138	92	112	90	DHD3.5	76
TGZ103-340-140/6	140	6	152	105	126	103	DHD340A	76
TGZ106-340-146/7.5	146	7.5	158	108	129	106	DHD340A	76
TGZ121-350-168/10.5	168	10.5	189	123.5	145.5	121	DHD350R	76/89
TGZ130-350-168/8	168	8	189	132	149	130	DHD350R	76/89
TGZ136-350-178/9	178	9	192	138	158	136	DHD350R	76/89
TGZ139-350-183/10	183	10	195	141	161	139	DHD350R	76/89
TGZ148-360-194/6.5	194	6.5	211	150	179	148	DHD360	114
TGZ163-360-219/7	219	7	232	165	203	163	DHD360	114
TGZ163-360-219/12.5	219	12.5	232	165	191	163	DHD360	114
TGZ218-380-273/11.5	273	11.5	308	220	247	218	DHD380	114/140
TGZ218-380-273/6.5	273	11.5	308	220	257	218	DHD380	114/140
TGZ253-110-324/9.5	324	9.5	348	255	303	253	DHD110	140/194
TGZ338-112-406/9.5	406	9.5	440	340	382	338	DHD112	194/273

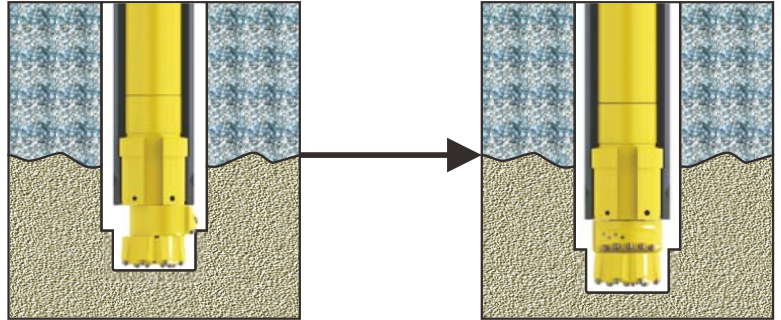
(The data of all the performance parameters are based on ideal working conditions, the company reserves the right to modify parameters)
(本资料所有性能参数均基于理想的工作条件，公司保留修改参数的权利)

偏心跟管钻具

Eccentric Drilling Tools with casing tube

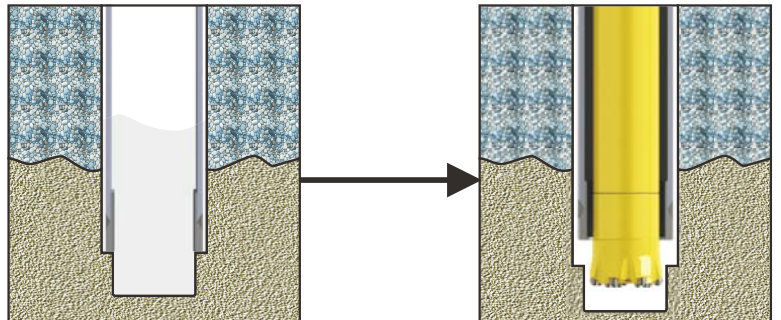
偏心跟管钻具钻进步骤

Eccentric Drilling tools with casing tube step-by-step



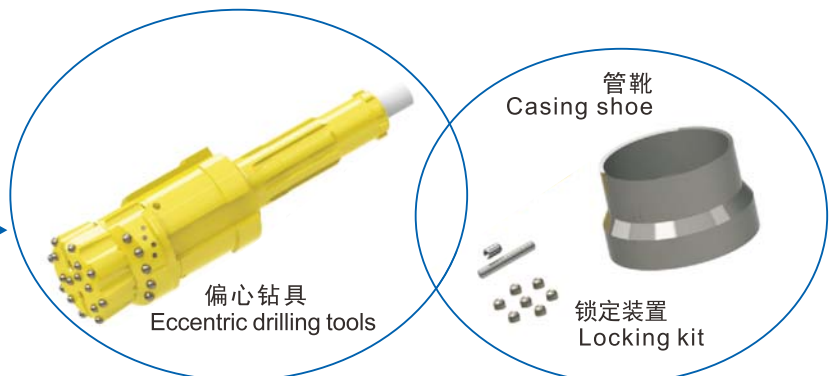
1. 偏心跟管是由一个导向钻头一个偏心钻头和一个导向器组成。在进行钻孔操作时，偏心钻头扩出足够大的孔使套管尾随其后潜入，而同时粉尘从套管内被吹走
When drilling, the PGZ reamer swings out and drills a hole wide enough for the casing tube to slide down behind the reamer.

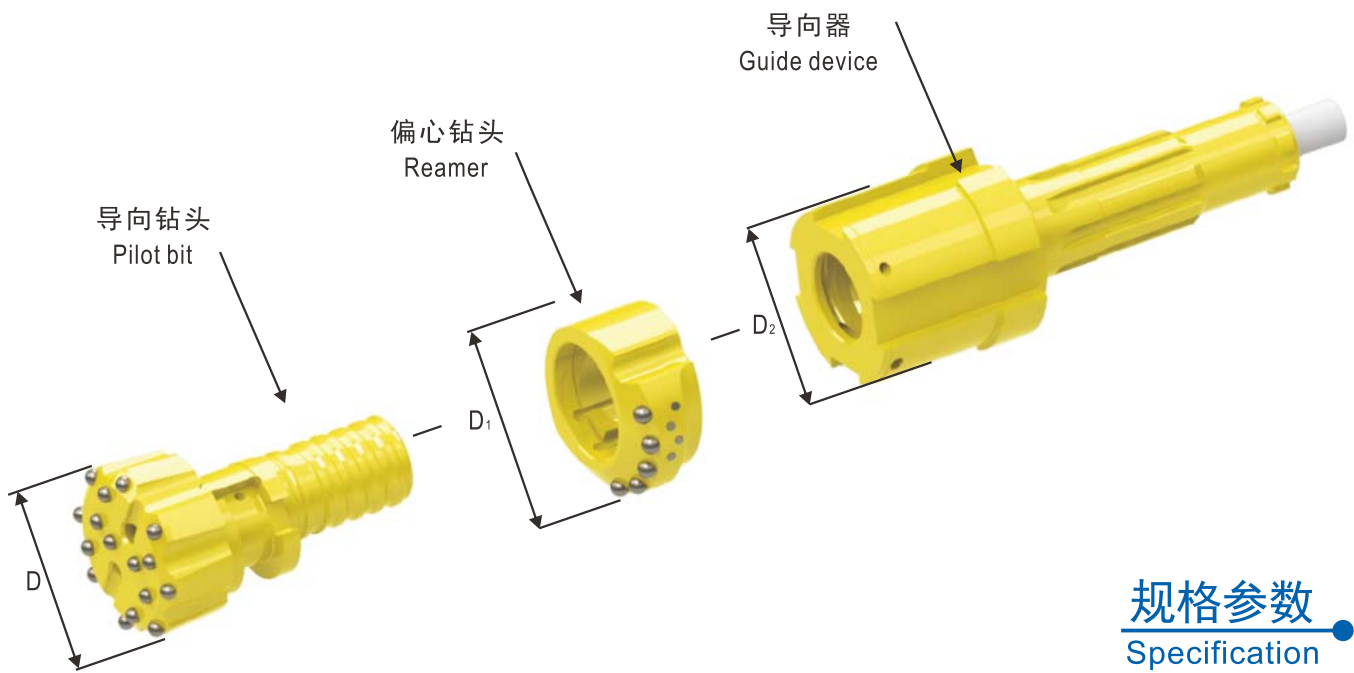
2. 当钻进达到设定深度后，钻具反方向旋转，偏心钻头被收拢与导向钻头位置重合，此时钻具可从套管内提钻取出
When required depth is reached, the drill is reversed and the reamer swings in, allowing the bit to pass through the casing.



3. 用水泥浆或其他结合剂使套管固定在孔底或拔出
Casing tube is pulled out directly or fixed at the bottom of the hole by means of cement grout or other agglutinant.

4. 使用常规的潜孔钻头将其从套管内放入至孔底又可继续钻进，用潜孔钻头持续钻孔至规定的深度
Drilling continues to the desired depth using conventional DTH equipment.





规格参数

Specification

总成代号 Assembly Code	套管 Casing tube		偏心扩孔直径 Max Reaming dia. D ₁ (mm)	导向钻头直径 Pilot bit dia. D (mm)	导向器 Guide device D ₂ (mm)	尾柄型号 shank style
	外径 Outside dia. (mm)	最大壁厚 Wall thickness (mm)				
PGZ82-3.5-108/6	108	6	116	82	94	DHD3.5
PGZ90-3.5-114/6	114	6	123	90	100	DHD3.5
PGZ115-340-142/7	142	7	151	115	126	DHD340A
PGZ115-340-146/7.5	146	7.5	155	115	128	DHD340A
PGZ140-350-168/8	168	8	189	140	149	DHD350R
PGZ140-350-178/9	178	9	192	144	156	DHD350R
PGZ149-350-183/10	183	10	197	149	161	DHD350R
PGZ165-360-195/6.5	195	6.5	211	165	179	DHD360
PGZ180-360-219/12.5	219	12.5	232	179	191	DHD360
PGZ190-360-219/7	219	7	236	190	203	DHD360
PGZ230-380-273/11.5	273	11.5	286	228	247	DHD380
PGZ240-380-273/6.5	273	6.5	308	240	257	DHD380

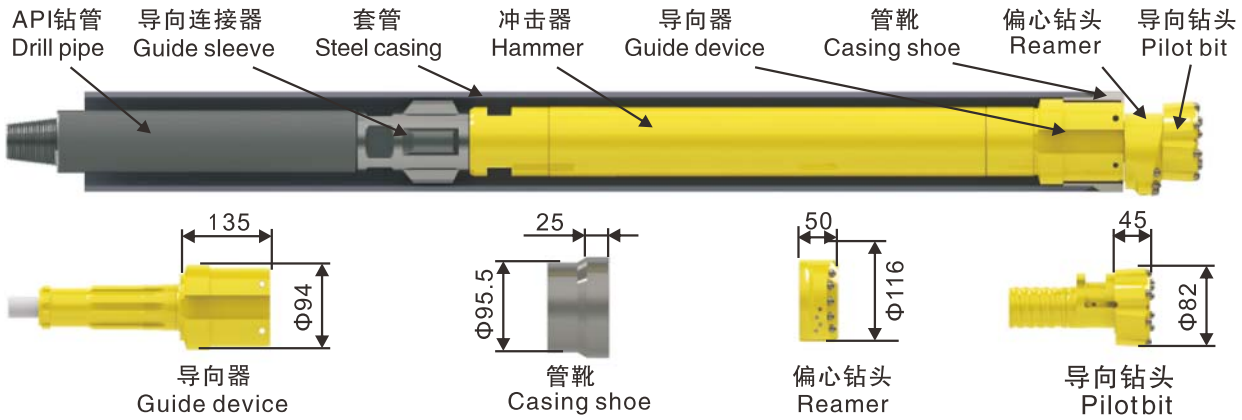
(The data of all the performance parameters are based on ideal working conditions, the company reserves the right to modify parameters)
(本资料所有性能参数均基于理想的工作条件, 公司保留修改参数的权利)

偏心跟管钻具

Eccentric Drilling Tools with casing tube

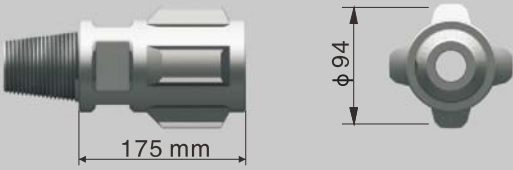
总成代号Assembly Code:

PGZ82-3.5-108/6



套管的选材范围(Alternative casings may be used):

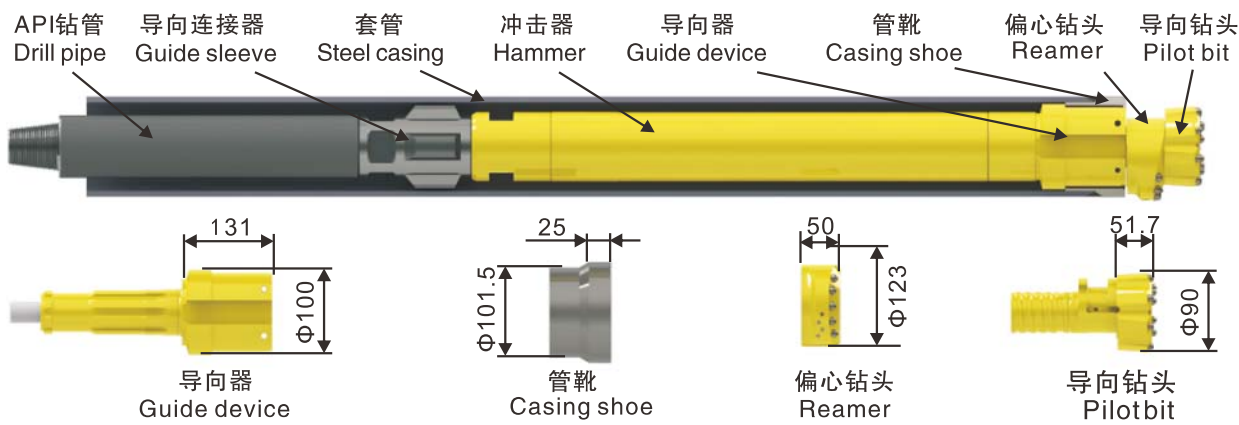
最大外径 (Maximum outside diameter)	108mm
最小内径 (Minimum inside diameter)	96mm
壁厚 (Wall thickness)	6mm

部件图 Description	单重(kg) Weight	件号 Part NO.
PGZ82-3.5-108/6尾柄适用于TND-IR3.5、DHD3.5、TD3.5 型冲击器 PGZ82-3.5-108/6 shank for TND-IR3.5、DHD3.5、TD3.5 hammer		
导向器 Guide device	6.20	DXQ823.5
管靴 Casing shoe	0.80	GX82
偏心钻头 Eccentric reamer	1.00	PZT82116
导向钻头 Pilot bit	3.00	DZT82
导向连接器 Guide sleeve API 2 $\frac{3}{8}$ " REG 	5.80	DLQ82
扳手槽 Wrench flat 65mm		
导向器的锁定装置包含三部分Guide device locking kit is comprised of three sets: 三部分分别是: 2个导向钻头插销, 2个自锁弹簧和8个锁定球, 还有1个用于导向 钻头和弹簧卸销棒 2 pilot bit pins, 2 self-locking spring pins and 8 locking balls, one pusher for pilot bit pin and spring pin. A 导向钻头插销 Pilot bit pin ($\phi 10 \times 51$ mm) 1 piece 0.02 PGZ82-01 B 自锁弹簧Self-locking spring pin ($\phi 11 \times 15$ mm) 1 piece 0.02 PGZ82-02 C 卸销棒 Pusher for pilot bit pin ($\phi 7.8 \times 140$ mm) 1 piece 0.04 PGZ82-03 D 锁定球 Locking ball ($\phi 9.5$ mm) 1 piece 0.01 PGZ82-04 		

偏心跟管钻具

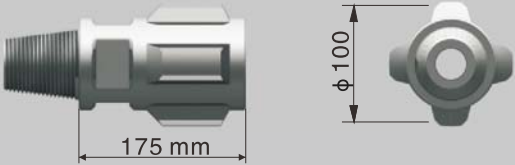
Eccentric Drilling Tools with casing tube

总成代号Assembly Code: PGZ90-3.5-114/6



套管的选材范围(Alternative casings may be used):

最大外径 (Maximum outside diameter)	115mm
最小内径 (Minimum inside diameter)	102mm
壁厚 (Wall thickness)	6mm

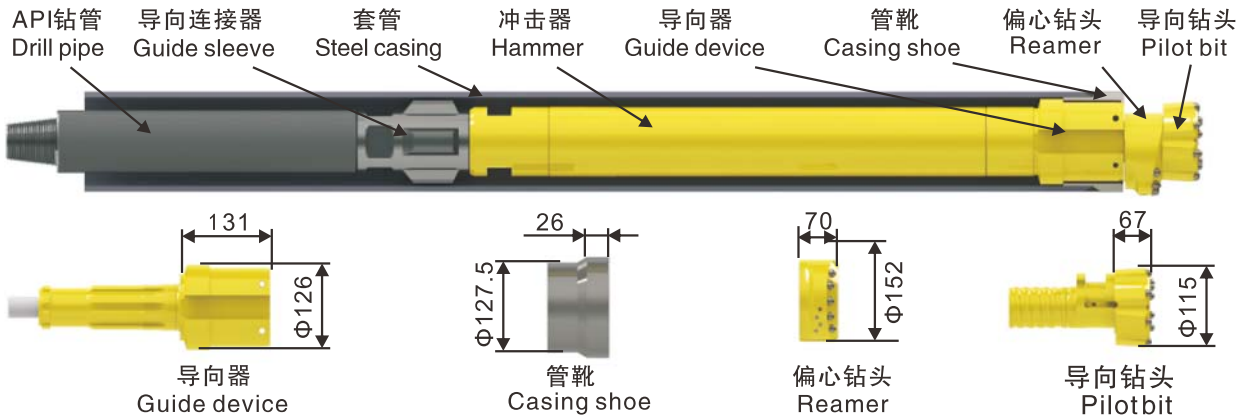
部件图 Description	单重(kg) Weight	件号 Part NO.
PGZ90-3.5-114/6尾柄适用于TND-IR3.5、DHD3.5、TD3.5 型冲击器 PGZ90-3.5-114/6 shank for TND-IR3.5、DHD3.5、TD3.5 hammer		
导向器 Guide device	7.80	DXQ903.5
管靴 Casing shoe	1.10	GX90
偏心钻头 Eccentric reamer	1.35	PZT90123
导向钻头 Pilot bit	3.60	DZT90
导向连接器 Guide sleeve API 2 $\frac{3}{8}$ " REG 	5.80	DLQ90
扳手槽 Wrench flat 65mm		
导向器的锁定装置包含三部分Guide device locking kit is comprised of three sets: 三部分是: 2个导向钻头插销, 2个自锁弹簧和8个锁定球, 还有1个用于导向钻头 和弹簧卸销棒 2 pilot bit pins, 2 self-locking spring pins and 8 locking balls, one pusher for pilot bit pin and spring pin. A 导向钻头插销 Pilot bit pin ($\phi 10 \times 51\text{mm}$) 1 piece 0.02 PGZ90-01 B 自锁弹簧Self-locking spring pin ($\phi 11 \times 15\text{mm}$) 1 piece 0.02 PGZ90-02 C 卸销棒 Pusher for pilot bit pin ($\phi 7.8 \times 140\text{mm}$) 1 piece 0.04 PGZ90-03 D 锁定球 Locking ball ($\phi 9.5\text{mm}$) 1 piece 0.01 PGZ90-04 		

偏心跟管钻具

Eccentric Drilling Tools with casing tube

总成代号Assembly Code:

PGZ115-340-142/7

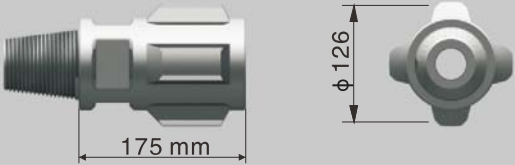


套管的选材范围(Alternative casings may be used):

最大外径 (Maximum outside diameter) 142mm

最小内径 (Minimum inside diameter) 128mm

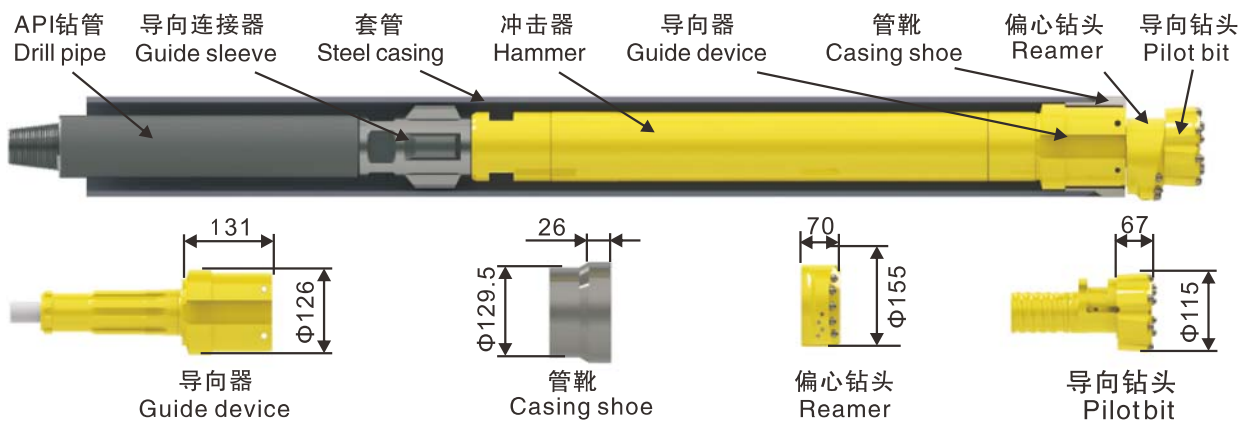
壁厚 (Wall thickness) 7mm

部件图 Description	单重(kg) Weight	件号 Part NO.
PGZ115-340-142/7尾柄适用于TND-IR340、DHD340A、TD4 型冲击器 PGZ115-340-142/7 shank for TND-IR340、DHD340A、TD4 hammer		
导向器 Guide device	11.0	DXQ115340
管靴 Casing shoe	1.60	GX115A
偏心钻头 Eccentric reamer	2.60	PZT115158
导向钻头 Pilot bit	7.80	DZT115
导向连接器 Guide sleeve API 2 $\frac{3}{8}$ " REG 	8.50	DLQ115
扳手槽 Wrench flat 65mm		
导向器的锁定装置包含三部分Guide device locking kit is comprised of three sets: 三部分分别是: 2个导向钻头插销, 2个自锁弹簧和8个锁定球, 还有1个用于导向 钻头和弹簧卸销棒 2 pilot bit pins, 2 self-locking spring pins and 8 locking balls, one pusher for pilot bit pin and spring pin. A 导向钻头插销 Pilot bit pin ($\phi 12 \times 60$ mm) 1 piece B 自锁弹簧Self-locking spring pin ($\phi 13 \times 20$ mm) 1 piece C 卸销棒 Pusher for pilot bit pin ($\phi 10 \times 150$ mm) 1 piece D 锁定球 Locking ball ($\phi 11$ mm) 1 piece 	0.03 0.02 0.09 0.01	PGZ115-01 PGZ115-02 PGZ115-03 PGZ115-04

偏心跟管钻具

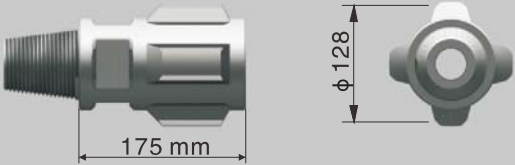
Eccentric Drilling Tools with casing tube

总成代号Assembly Code: PGZ115-340-146/8



套管的选材范围(Alternative casings may be used):

最大外径 (Maximum outside diameter)	146mm
最小内径 (Minimum inside diameter)	130mm
壁厚 (Wall thickness)	8mm

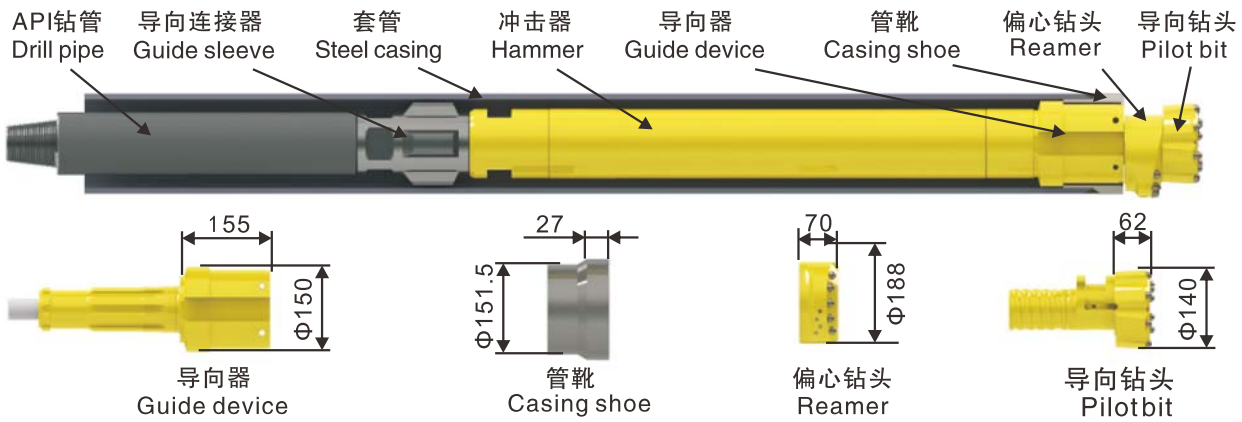
部件图 Description	单重(kg) Weight	件号 Part NO.
PGZ115-340-146/8尾柄适用于TND-IR340、DHD340A、TD4 型冲击器 PGZ115-340-146/8 shank for TND-IR340、DHD340A、TD4 hammer		
导向器 Guide device	11.7	DXQ115340A
管靴 Casing shoe	1.60	GX115A
偏心钻头 Eccentric reamer	2.60	PZT115158A
导向钻头 Pilot bit	7.80	DZT115
导向连接器 Guide sleeve API 2 $\frac{3}{8}$ " REG 	8.50	DLQ115A
扳手槽 Wrench flat 65mm		
导向器的锁定装置包含三部分Guide device locking kit is comprised of three sets: 三部分是: 2个导向钻头插销, 2个自锁弹簧和8个锁定球, 还有1个用于导向钻头 和弹簧卸销棒 2 pilot bit pins, 2 self-locking spring pins and 8 locking balls, one pusher for pilot bit pin and spring pin. A 导向钻头插销 Pilot bit pin ($\phi 12 \times 60\text{mm}$) 1 piece 0.03 PGZ115-01 B 自锁弹簧Self-locking spring pin ($\phi 13 \times 20\text{mm}$) 1 piece 0.02 PGZ115-02 C 卸销棒 Pusher for pilot bit pin ($\phi 10 \times 150\text{mm}$) 1 piece 0.09 PGZ115-03 D 锁定球 Locking ball ($\phi 11\text{mm}$) 1 piece 0.01 PGZ115-04 		

偏心跟管钻具

Eccentric Drilling Tools with casing tube

总成代号Assembly Code:

PGZ140-350-168/8



套管的选材范围(Alternative casings may be used):

最大外径 (Maximum outside diameter) 168mm

最小内径 (Minimum inside diameter) 152mm

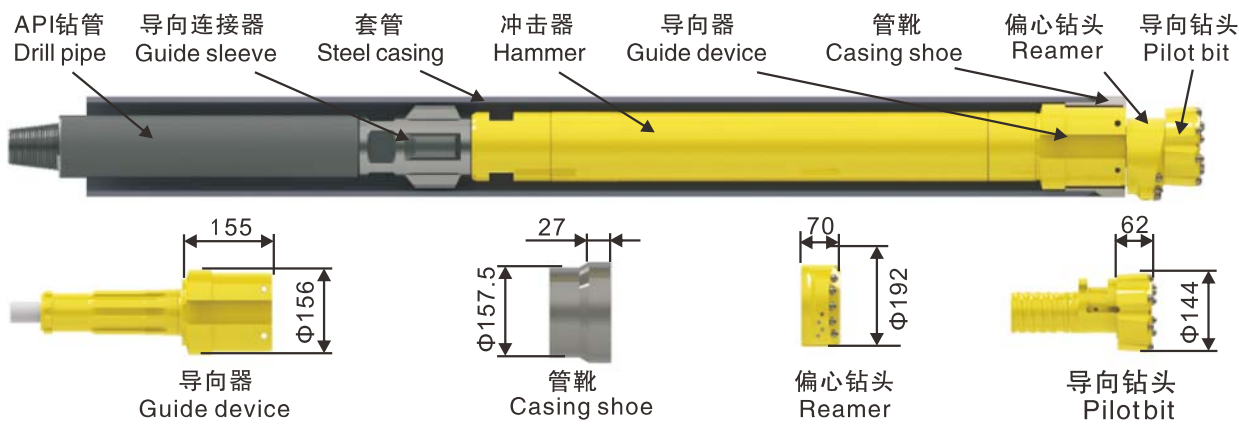
壁厚 (Wall thickness) 8mm

部件图 Description		单重(kg) Weight	件号 Part NO.
PGZ140-350-168/8尾柄适用于TND-IR350、DHD350R、COP54、DHD5 型冲击器 PGZ140-350-168/8 shank for TND-IR350、DHD350R、COP54、DHD5 hammer			
导向器 Guide device		11.9	DXQ140350
管靴 Casing shoe		2.40	GX140
偏心钻头 Eccentric reamer		4.10	PZT140188
导向钻头 Pilot bit		11.0	DZT140
导向连接器 Guide sleeve			
扳手槽 Wrench flat 65mm		9.00	DLQ140
扳手槽 Wrench flat 95mm		16.4	DLQ140-1
导向器的锁定装置包含三部分Guide device locking kit is comprised of three sets: 三部分是：2个导向钻头插销，2个自锁弹簧和8个锁定球，还有1个用于导向 钻头和弹簧卸销棒 2 pilot bit pins,2 self-locking spring pins and 8 locking balls, one pusher for pilot bit pin and spring pin.			
A 导向钻头插销 Pilot bit pin	(φ 12 × 75mm) 1 piece	0.03	PGZ140-01
B 自锁弹簧Self-locking spring pin	(φ 13 × 20mm) 1 piece	0.02	PGZ140-02
C 卸销棒 Pusher for pilot bit pin	(φ 10 × 160mm) 1 piece	0.10	PGZ140-03
D 锁定球 Locking ball	(φ 11mm) 1 piece	0.01	PGZ140-04
			

偏心跟管钻具

Eccentric Drilling Tools with casing tube

总成代号Assembly Code: PGZ145-350-178/9



套管的选材范围(Alternative casings may be used):
最大外径 (Maximum outside diameter)..... 178mm
最小内径 (Minimum inside diameter) 158mm
壁厚 (Wall thickness) 9mm

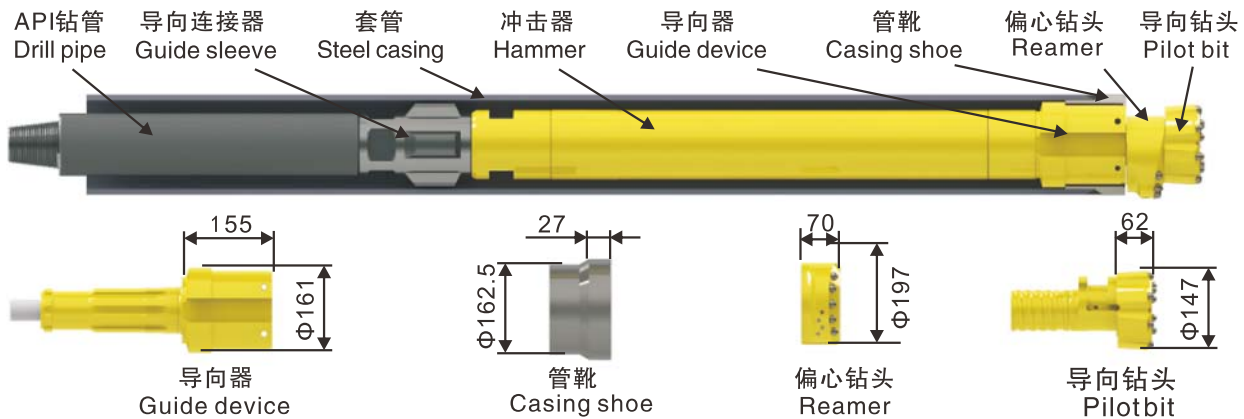
部件图 Description	单重(kg) Weight	件号 Part NO.
PGZ145-350-178/9尾柄适用于TND-IR350、DHD350R、COP54、DHD5 型冲击器 PGZ145-350-178/9 shank for TND-IR350、DHD350R、COP54、DHD5 hammer		
导向器 Guide device	20.5	DXQ145350
管靴 Casing shoe	2.60	GX145
偏心钻头 Eccentric reamer	4.50	PZT145192
导向钻头 Pilot bit	12.0	DZT145
导向连接器 Guide sleeve		
扳手槽 Wrench flat 65mm		
扳手槽 Wrench flat 95mm		
API 2 3/8 " REG	9.00	DLQ145
API 3 1/2 " REG	16.4	DLQ145-1
导向器的锁定装置包含三部分Guide device locking kit is comprised of three sets: 三部分是: 2个导向钻头插销, 2个自锁弹簧和8个锁定球, 还有1个用于导向 钻头和弹簧卸销棒 2 pilot bit pins, 2 self-locking spring pins and 8 locking balls, one pusher for pilot bit pin and spring pin.		
A 导向钻头插销 Pilot bit pin	0.03	PGZ140-01
B 自锁弹簧Self-locking spring pin	0.02	PGZ140-02
C 卸销棒 Pusher for pilot bit pin	0.10	PGZ140-03
D 锁定球 Locking ball	0.01	PGZ140-04

偏心跟管钻具

Eccentric Drilling Tools with casing tube

总成代号Assembly Code:

PGZ147-350-183/10



套管的选材范围(Alternative casings may be used):

最大外径 (Maximum outside diameter) 183mm

最小内径 (Minimum inside diameter) 163mm

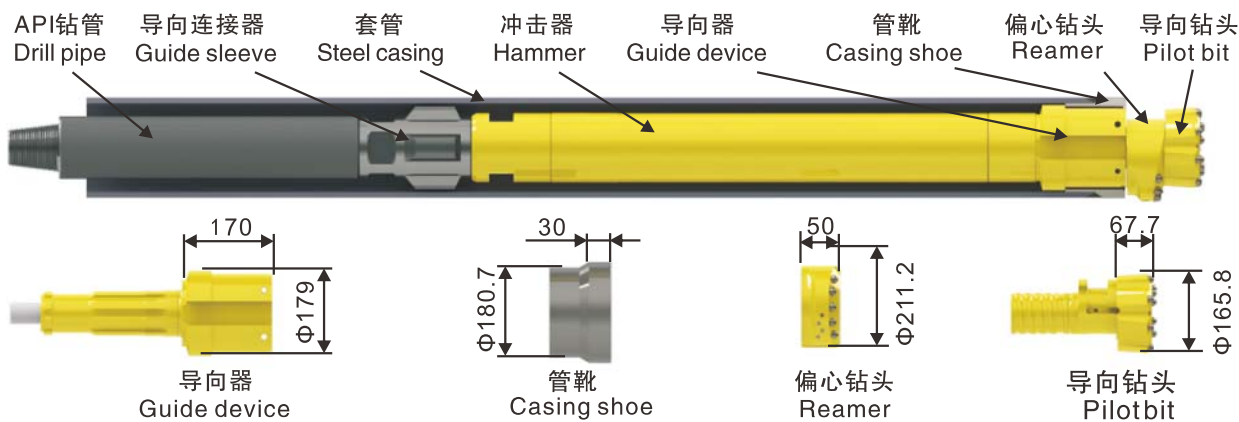
壁厚 (Wall thickness) 10mm

部件图 Description		单重(kg) Weight	件号 Part NO.
PGZ147-350-183/10尾柄适用于TND-IR350、DHD350R、COP54、DHD5 型冲击器 PGZ147-350-183/10 shank for TND-IR350、DHD350R、COP54、DHD5 hammer			
导向器 Guide device		21.0	DXQ147350
管靴 Casing shoe		2.80	GX147
偏心钻头 Eccentric reamer		4.80	PZT147197
导向钻头 Pilot bit		12.5	DZT147
导向连接器 Guide sleeve			
扳手槽 Wrench flat 65mm		9.50	DLQ147
	 API 2 $\frac{3}{8}$ " REG		
扳手槽 Wrench flat 95mm		17.0	DLQ147-1
	 API 3 $\frac{1}{2}$ " REG		
导向器的锁定装置包含三部分Guide device locking kit is comprised of three sets: 三部分分别是：2个导向钻头插销，2个自锁弹簧和8个锁定球，还有1个用于导向 钻头和弹簧卸销棒 2 pilot bit pins, 2 self-locking spring pins and 8 locking balls, one pusher for pilot bit pin and spring pin.			
A 导向钻头插销 Pilot bit pin	($\phi 12 \times 75\text{mm}$) 1 piece	0.03	PGZ140-01
B 自锁弹簧Self-locking spring pin	($\phi 13 \times 20\text{mm}$) 1 piece	0.02	PGZ140-02
C 卸销棒 Pusher for pilot bit pin	($\phi 10 \times 160\text{mm}$) 1 piece	0.10	PGZ140-03
D 锁定球 Locking ball	($\phi 11\text{mm}$) 1 piece	0.01	PGZ140-04
   			

偏心跟管钻具

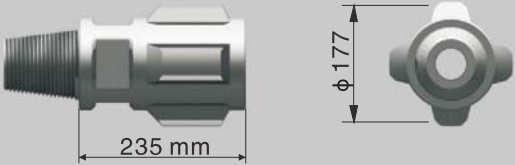
Eccentric Drilling Tools with casing tube

总成代号Assembly Code: PGZ165-360-195/6.5



套管的选材范围(Alternative casings may be used):

最大外径 (Maximum outside diameter)	195mm
最小内径 (Minimum inside diameter)	182mm
壁厚 (Wall thickness)	6.5mm

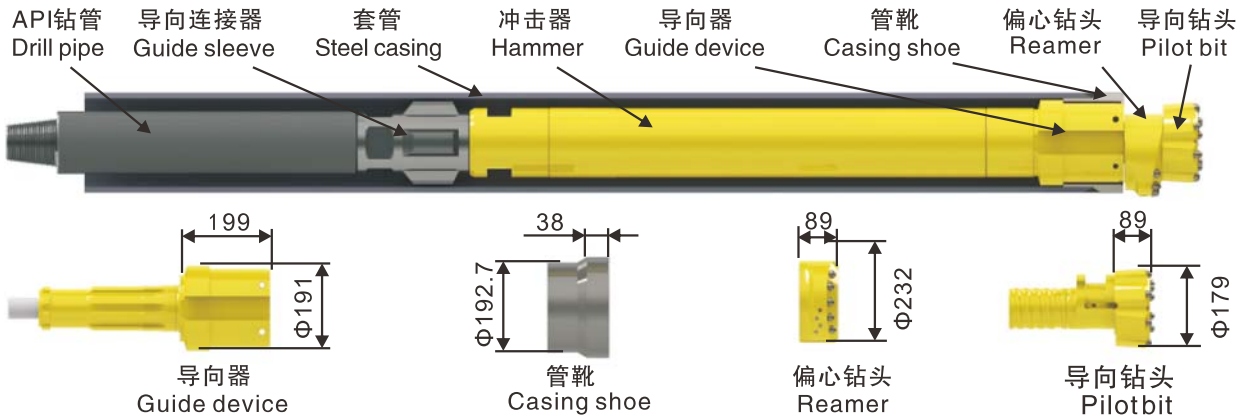
部件图 Description	单重(kg) Weight	件号 Part NO.
PGZ165-360-195/6.5尾柄适用于TND-IR360、DHD360、COP64、DHD6 型冲击器 PGZ165-360-195/6.5 shank for TND-IR360、DHD360、COP64、DHD6 hammer		
导向器 Guide device	33.5	DXQ165360
管靴 Casing shoe	3.20	GX165
偏心钻头 Eccentric reamer	7.00	PZT165211
导向钻头 Pilot bit	17.0	DZT165
导向连接器 Guide sleeve API 3 $\frac{1}{2}$ " REG 	21.5	DLQ165
扳手槽 Wrench flat 95mm		
导向器的锁定装置包含三部分Guide device locking kit is comprised of three sets: 三部分是: 2个导向钻头插销, 2个自锁弹簧和8个锁定球, 还有1个用于导向钻头 和弹簧卸销棒 2 pilot bit pins, 2 self-locking spring pins and 8 locking balls, one pusher for pilot bit pin and spring pin. A 导向钻头插销 Pilot bit pin (phi 12 x 90mm) 1 piece B 自锁弹簧Self-locking spring pin (phi 13 x 26mm) 1 piece C 卸销棒 Pusher for pilot bit pin (phi 10 x 160mm) 1 piece D 锁定球 Locking ball (phi 11mm) 1 piece 	0.02 0.02 0.10 0.01	PGZ165-01 PGZ165-02 PGZ165-03 PGZ165-04

偏心跟管钻具

Eccentric Drilling Tools with casing tube

总成代号Assembly Code:

PGZ180-360-219/12.5

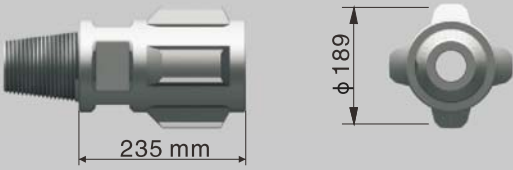


套管的选材范围(Alternative casings may be used):

最大外径 (Maximum outside diameter)..... 219mm

最小内径 (Minimum inside diameter) 194mm

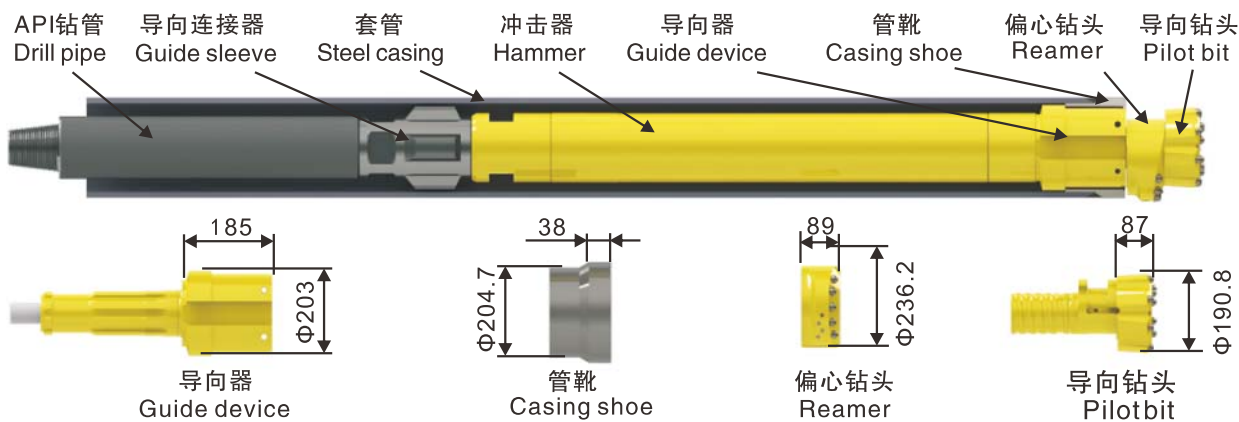
壁厚 (Wall thickness) 12.5mm

部件图 Description	单重(kg) Weight	件号 Part NO.
PGZ180-360-219/12.5尾柄适用于TND-IR360、DHD360、COP64、DHD6 型冲击器 PGZ180-360-219/12.5 shank for TND-IR360、DHD360、COP64、DHD6 hammer		
导向器 Guide device	44.0	DXQ180360
管靴 Casing shoe	4.00	GX180
偏心钻头 Eccentric reamer	10.0	PZT180232
导向钻头 Pilot bit	23.7	DZT180
导向连接器 Guide sleeve API 3 $\frac{1}{2}$ " REG 	25.0	DLQ180
扳手槽 Wrench flat 95mm		
导向器的锁定装置包含三部分Guide device locking kit is comprised of three sets: 三部分分别是: 2个导向钻头插销, 2个自锁弹簧和8个锁定球, 还有1个用于导向 钻头和弹簧卸销棒 2 pilot bit pins, 2 self-locking spring pins and 8 locking balls, one pusher for pilot bit pin and spring pin. A 导向钻头插销 Pilot bit pin ($\phi 12 \times 90$ mm) 1 piece B 自锁弹簧Self-locking spring pin ($\phi 13 \times 23$ mm) 1 piece C 卸销棒 Pusher for pilot bit pin ($\phi 10 \times 160$ mm) 1 piece D 锁定球 Locking ball ($\phi 11$ mm) 1 piece 	0.05 0.02 0.10 0.01	PGZ180-01 PGZ180-02 PGZ180-03 PGZ180-04

偏心跟管钻具

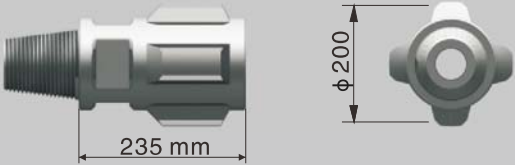
Eccentric Drilling Tools with casing tube

总成代号Assembly Code: PGZ190-360-219/7



套管的选材范围(Alternative casings may be used):

最大外径 (Maximum outside diameter)	219mm
最小内径 (Minimum inside diameter)	205mm
壁厚 (Wall thickness)	7mm

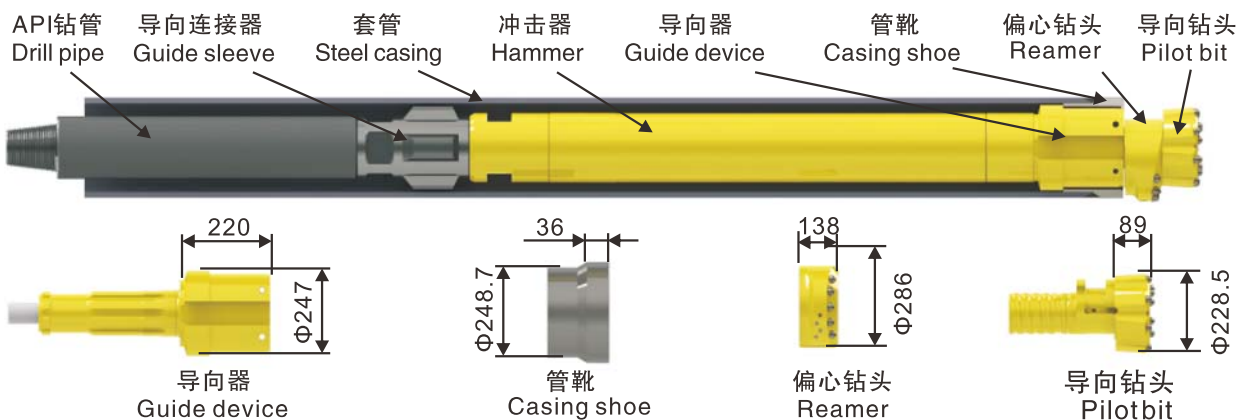
部件图 Description	单重(kg) Weight	件号 Part NO.
PGZ190-360-195/6.5尾柄适用于TND-IR360、DHD360、COP64、DHD6 型冲击器 PGZ190-360-195/6.5 shank for TND-IR360、DHD360、COP64、DHD6 hammer		
导向器 Guide device	44.0	DXQ190360
管靴 Casing shoe	4.00	GX190
偏心钻头 Eccentric reamer	10.0	PZT190236
导向钻头 Pilot bit	23.7	DZT190
导向连接器 Guide sleeve API 3 $\frac{1}{2}$ " REG 	28.0	DLQ190
扳手槽 Wrench flat 95mm		
导向器的锁定装置包含三部分Guide device locking kit is comprised of three sets: 三部分是: 2个导向钻头插销, 2个自锁弹簧和8个锁定球, 还有1个用于导向钻头 和弹簧卸销棒 2 pilot bit pins, 2 self-locking spring pins and 8 locking balls, one pusher for pilot bit pin and spring pin. A 导向钻头插销 Pilot bit pin ($\Phi 14 \times 95\text{mm}$) 1 piece 0.05 PGZ190-01 B 自锁弹簧Self-locking spring pin ($\Phi 15 \times 25\text{mm}$) 1 piece 0.02 PGZ190-02 C 卸销棒 Pusher for pilot bit pin ($\Phi 10 \times 160\text{mm}$) 1 piece 0.10 PGZ190-03 D 锁定球 Locking ball ($\Phi 13\text{mm}$) 1 piece 0.01 PGZ190-04 		

偏心跟管钻具

Eccentric Drilling Tools with casing tube

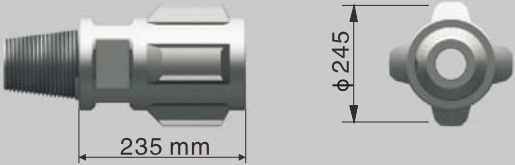
总成代号Assembly Code:

PGZ230-380-273/11.5



套管的选材范围(Alternative casings may be used):

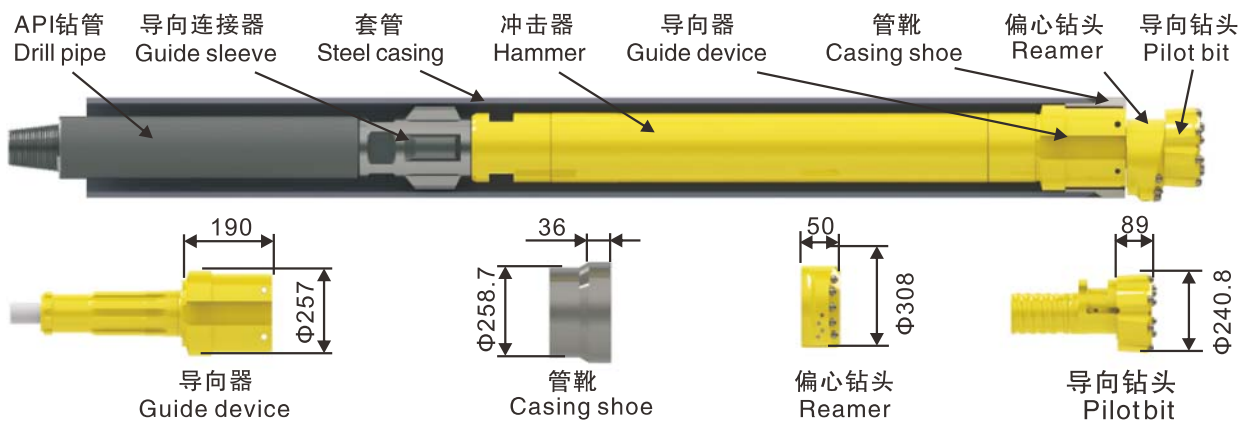
最大外径 (Maximum outside diameter)	273mm
最小内径 (Minimum inside diameter)	250mm
壁厚 (Wall thickness)	11.5mm

部件图 Description	单重(kg) Weight	件号 Part NO.
PGZ230-380-273/11.5尾柄适用于TND-IR380、DHD380、COP84、DHD8 型冲击器 PGZ230-380-273/11.5 shank for TND-IR380、DHD380、COP84、DHD8 hammer		
导向器 Guide device	67.0	DXQ230380
管靴 Casing shoe	6.80	GX230
偏心钻头 Eccentric reamer	18.0	PZT230286
导向钻头 Pilot bit	47.0	DZT230
导向连接器 Guide sleeve API 3 $\frac{1}{2}$ " REG 	30.0	DLQ230
扳手槽 Wrench flat 95mm 导向器的锁定装置包含三部分Guide device locking kit is comprised of three sets: 三部分分别是: 2个导向钻头插销, 2个自锁弹簧和8个锁定球, 还有1个用于导向钻头 和弹簧卸销棒 2 pilot bit pins, 2 self-locking spring pins and 8 locking balls, one pusher for pilot bit pin and spring pin. A 导向钻头插销 Pilot bit pin ($\Phi 14 \times 120$ mm) 1 piece 0.05 PGZ230-01 B 自锁弹簧Self-locking spring pin ($\Phi 15 \times 25$ mm) 1 piece 0.02 PGZ230-02 C 卸销棒 Pusher for pilot bit pin ($\Phi 10 \times 160$ mm) 1 piece 0.10 PGZ230-03 D 锁定球 Locking ball ($\Phi 15$ mm) 1 piece 0.01 PGZ230-04 		

偏心跟管钻具

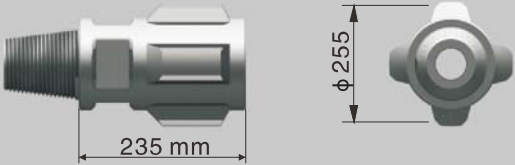
Eccentric Drilling Tools with casing tube

总成代号Assembly Code: PGZ240-380-273/6.5



套管的选材范围(Alternative casings may be used):

最大外径 (Maximum outside diameter)	273mm
最小内径 (Minimum inside diameter)	260mm
壁厚 (Wall thickness)	6.5mm

部件图 Description	单重(kg) Weight	件号 Part NO.
PGZ240-380-273/6.5尾柄适用于TND-IR380、DHD380、COP84、DHD8型冲击器 PGZ240-380-273/6.5 shank for TND-IR380、DHD380、COP84、DHD8 hammer		
导向器 Guide device	67.0	DXQ240380
管靴 Casing shoe	6.80	GX240
偏心钻头 Eccentric reamer	18.0	PZT240308
导向钻头 Pilot bit	49.0	DZT240
导向连接器 Guide sleeve API 3 $\frac{1}{2}$ " REG 	31	DLQ240
扳手槽 Wrench flat 95mm		
导向器的锁定装置包含三部分Guide device locking kit is comprised of three sets: 三部分是: 2个导向钻头插销, 2个自锁弹簧和8个锁定球, 还有1个用于导向钻头 和弹簧卸销棒 2 pilot bit pins, 2 self-locking spring pins and 8 locking balls, one pusher for pilot bit pin and spring pin. A 导向钻头插销 Pilot bit pin ($\Phi 14 \times 120$ mm) 1 piece B 自锁弹簧Self-locking spring pin ($\Phi 15 \times 25$ mm) 1 piece C 卸销棒 Pusher for pilot bit pin ($\Phi 10 \times 160$ mm) 1 piece D 锁定球 Locking ball ($\Phi 15$ mm) 1 piece 	0.14 0.02 0.10 0.01	PGZ240-01 PGZ240-02 PGZ240-03 PGZ240-04

高气压潜孔钻机配用API螺纹钻杆 — 我们做的很好

API thread Drill Pipe matched up with
High Air Pressure Drill Rig — we're doing pretty well

● 标准API螺纹及螺纹导向加工一次完成，是我们工艺诀窍。

Standard API thread forming and orientating processed at one step, which is our technical highlight.

● 不是摩擦焊接就牢固，经过了特殊工艺处理的摩擦焊，能确保焊接质量。

Not all friction welding is strong, after a specialized friction welding process, welding outcome can be ensured.

● 每一个工艺环节不被忽略，R圆弧都用数控加工。
Each processing step is stringently controlled, all R arcs are CNC machined.

● 高强度和耐磨性匹配优质合金钢管，由国家知名特钢厂供应，（钢管厚度和材质可供用户选择）。

Hardness and wear resistance combined alloy steel, supplied by national top level special steel manufacturer. (Pipe thickness and material can be users' choice)

● 钻杆弯曲校正是每支钻杆必须完成工艺步骤。

Pipe curvature correction is a must process for each drill pipe

● 接头采用优质合金钢材料，严格热处理及标准API螺纹加工技术，这些容易被折扣的地方我们做的很认真，确保稳定性和丝扣耐用性。

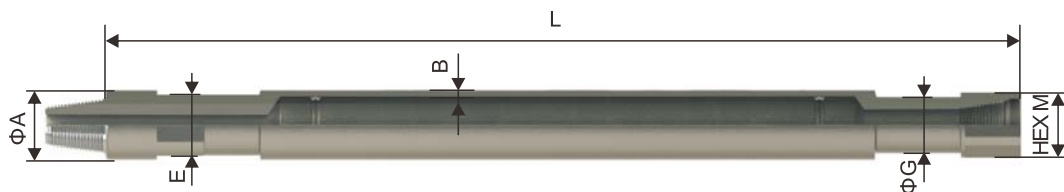
Premium alloy steel made joints, strictly controlled heat treatment process and standard API thread processing technology; we pay high attention to all these easily ignored details to ensure pipe stability and thread durability.

钻管

Drill pipes

阿特拉斯-英格索兰 T4,IRT4 钻杆

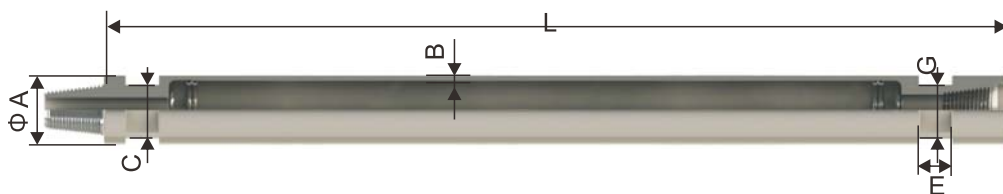
Atlas Copco - Ingersoll Rand T4 IRT4 Drill Pipe



外径(mm)	壁厚(mm)	有效长度(mm)	扳手槽尺寸(mm)	凹槽外径(mm)	六方尺寸(mm)	连接螺纹
OD A	Wall B	Length L	Across Flat E	Recess Dia. G	Across Hex M	Connection P/N
102	8.38	6350	89	89	95	2 ⁷ / ₈ " REG
102	8.38	7620	89	89	95	2 ⁷ / ₈ " REG
114	8.56	6350	89	102	86	3 ¹ / ₂ " REG
114	8.56	6350	89	102	86	2 ⁷ / ₈ " IF
114	8.56	7620	89	102	86	3 ¹ / ₂ " REG
114	8.56	7620	89	102	86	2 ⁷ / ₈ " IF
114	12.70	7620	89	102	86	3 ¹ / ₂ " REG
114	19.05	6350	89	102	86	3 ¹ / ₂ " REG
114	19.05	7620	89	102	86	3 ¹ / ₂ " REG
127	9.19	6350	89	102	89	3 ¹ / ₂ " REG
127	9.19	7620	89	102	89	3 ¹ / ₂ " REG
127	12.70	6350	89	102	89	3 ¹ / ₂ " REG
127	19.05	7620	89	102	89	3 ¹ / ₂ " REG
127	12.70	6350	89	102	89	3 ¹ / ₂ " REG
127	12.70	7620	89	102	89	3 ¹ / ₂ " REG
140	12.70	6350	89	127	86	3 ¹ / ₂ Beco
140	12.70	7620	89	127	86	3 ¹ / ₂ Beco
140	12.70	6350	89	127	86	4FH
140	12.70	7620	89	127	86	4FH
140	19.05	6350	89	127	86	3 ¹ / ₂ Beco
140	19.05	7620	89	127	86	3 ¹ / ₂ Beco
140	19.05	6350	89	127	86	4FH
140	19.05	7620	89	127	86	4FH

常规钻杆

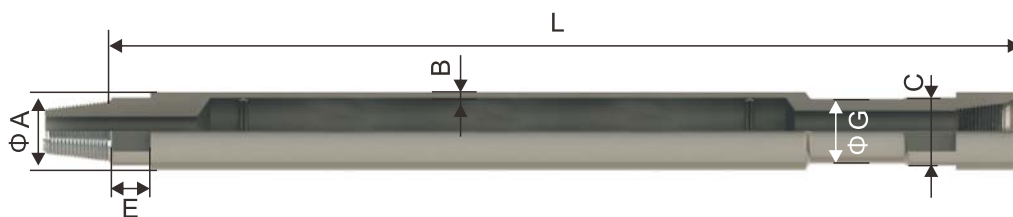
Standard Design Flush Joint Drill Pipe



外径(mm)	壁厚(mm)	有效长度(mm)	扳手槽尺寸(mm)	扳手槽长度(mm)	扳手槽尺寸(mm)	连接螺纹
OD A	Wall B	Length L	Across Flat C	Flat Length E	Across Flat G	Connection P/N
76	5.5	1000/1500/2000/3000	57	46	57	2 $\frac{3}{8}$ " REG
76	5.5	1000/1500/2000/3000	65	42	65	2 $\frac{3}{8}$ " REG
76	6.5	3000/4500/6000	65	42	65	2 $\frac{3}{8}$ " REG
89	5.5	1000/1500/2000/3000	65	42	65	2 $\frac{3}{8}$ " REG
89	6.5	1000/1500/2000/ 3000/4500/6000	65	42	65	2 $\frac{3}{8}$ " REG
89	5.5	1000/1500/2000/3000	65	42	65	2 $\frac{3}{8}$ " IF
89	6.5	1000/1500/2000/ 3000/4500/6000	65	42	65	2 $\frac{3}{8}$ " IF
114	6.5	1000/1500/2000/ 3000/4500/6000	95	45	95	2 $\frac{3}{8}$ " IF
114	6.5	1000/1500/2000/3000	95	45	95	3 $\frac{1}{2}$ " IF
114	6.5	1000/1500/2000/ 3000/4500/6000	95	45	95	3 $\frac{1}{2}$ " REG

美国善姆钻杆

Schramm Carousel Style Drill Pipe



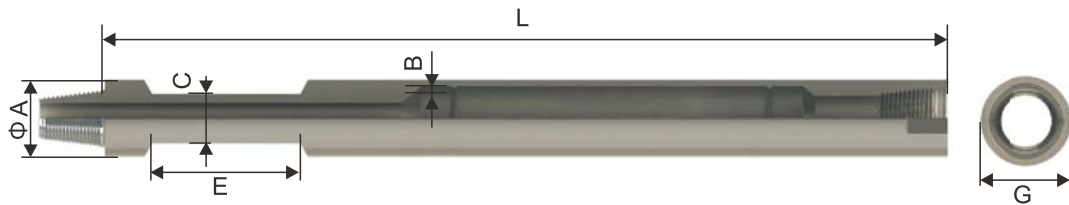
外径(mm)	壁厚(mm)	有效长度(mm)	扳手槽尺寸(mm)	扳手槽长度(mm)	凹处直径(mm)	连接螺纹
OD A	Wall B	Length L	Across Flat C	Flat Length E	Recess Dia. G	Connection P/N
89	9.35	6096	82	70	70	2 $\frac{3}{8}$ " IF
89	8.56	6096	98	57	89	3 $\frac{1}{2}$ " REG
89	8.56	7620	98	57	89	2 $\frac{7}{8}$ " IF
89	8.56	7620	98	57	89	3 $\frac{1}{2}$ " REG
89	8.56	7620	98	57	89	2 $\frac{7}{8}$ " IF

钻管

Drill pipes

山特维克D25/D40K钻杆

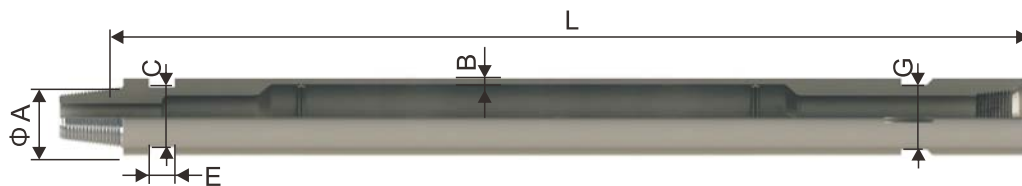
Sandvik/Driltech D25/D40K Drill Pipe



外径(mm)	壁厚(mm)	有效长度(mm)	扳手槽尺寸(mm)	扳手槽长度(mm)	扳手尺寸(mm)	连接螺纹
OD A	Wall B	Length L	Across Flat C	Flat Length E	Across Flat G	Connection P/N
89	8.00	6096	70	317.5	83	2 ³ / ₈ " IF
114	8.56	6096	76	317.5	102	3 ¹ / ₂ " REG
114	8.56	6096	76	317.5	102	2 ⁷ / ₈ " IF
114	8.56	7620	76	317.5	102	3 ¹ / ₂ " REG
114	8.56	7620	76	317.5	102	2 ⁷ / ₈ " IF
114	8.56	9144	76	317.5	102	3 ¹ / ₂ " REG
114	12.7	7620	76	317.5	102	3 ¹ / ₂ " REG
114	12.7	9144	76	317.5	102	3 ¹ / ₂ " REG
114	19.05	7620	76	317.5	102	3 ¹ / ₂ " REG
127	12.7	7620	76	317.5	102	3 ¹ / ₂ " REG
127	12.7	9144	76	317.5	102	3 ¹ / ₂ " REG
127	19.05	9144	76	317.5	102	3 ¹ / ₂ " REG
127	19.05	7625	76	317.5	117	3 ¹ / ₂ " Beco
140	19.05	7625	76	317.5	117	3 ¹ / ₂ " Beco
140	19.05	9144	76	317.5	117	3 ¹ / ₂ " Beco

CP650 钻杆

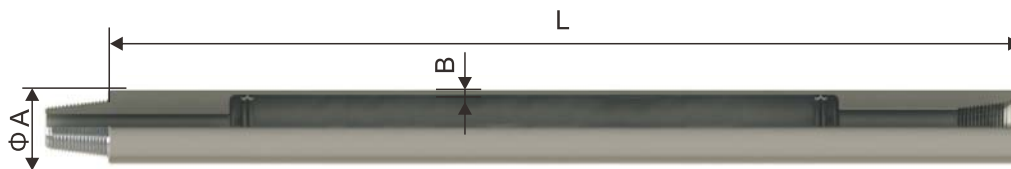
CP650 Drill Pipe



外径(mm)	壁厚(mm)	有效长度(mm)	扳手槽尺寸(mm)	扳手槽长度(mm)	尺寸(mm)	连接螺纹
OD A	Wall B	Length L	Across Flat C	Flat Length E	Dist From Shoulder G	Connection P/N
114	8.56	6096	95	38	152	3 ¹ / ₂ " REG
114	8.56	6096	95	38	152	3 ¹ / ₂ " REG

阿特拉斯F6/L6/L8钻杆

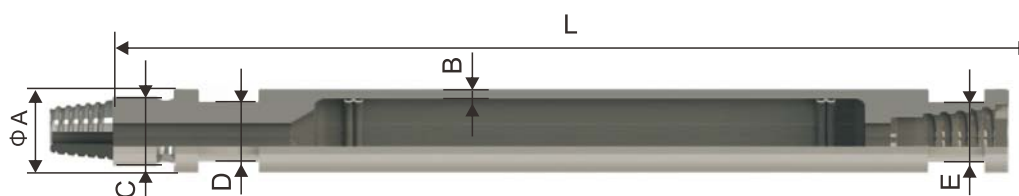
Design group Atlas Copco Roc F6/L6/L8



外径(mm)	壁厚(mm)	有效长度(mm)	扳手槽尺寸(mm)	扳手槽长度(mm)	扳手尺寸(mm)	连接螺纹
OD A	Wall B	Length L	Across Flat C	Flat Length E	Across Flat G	Connection P/N
76	6.3	4000	—	—	—	2 $\frac{3}{8}$ " REG
76	6.3	5000	—	—	—	2 $\frac{3}{8}$ " REG
89	6.3	4000	—	—	—	2 $\frac{3}{8}$ " REG
89	6.3	5000	—	—	—	2 $\frac{3}{8}$ " REG
89	6.3	6000	—	—	—	2 $\frac{3}{8}$ " REG
89	8.8	6000	—	—	—	2 $\frac{3}{8}$ " REG
102	6.3	4000	—	—	—	2 $\frac{7}{8}$ " REG
102	6.3	5000	—	—	—	2 $\frac{7}{8}$ " REG
102	6.3	6000	—	—	—	2 $\frac{7}{8}$ " REG
114	6.3	6000	—	—	—	3 $\frac{1}{2}$ " REG
114	8.8	6000	—	—	—	3 $\frac{1}{2}$ " REG
114	8.8	6000	—	—	—	4 $\frac{1}{2}$ " REG

CM760/780钻杆

Design group CM(CM760/780)

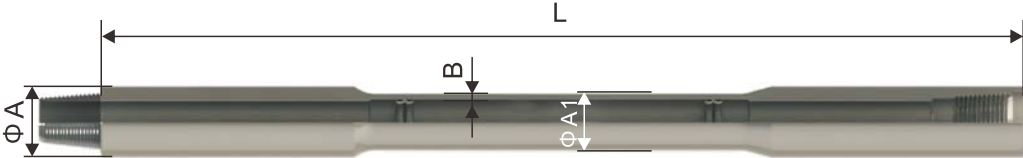


外径(mm)	壁厚(mm)	有效长度(mm)	扳手槽长度(mm)	扳手槽尺寸(mm)	扳手尺寸(mm)	连接螺纹
OD A	Wall B	Length L	Across Flat C	Flat Length D	Across Flat E	Connection P/N
102	8.5	4400	86	76	76	2 $\frac{1}{2}$ " Z/3 $\frac{1}{2}$ " REG
102	8.5	5000	86	76	76	2 $\frac{1}{2}$ " Z/2 $\frac{1}{2}$ " REG

钻管 Drill pipes

石油钻杆

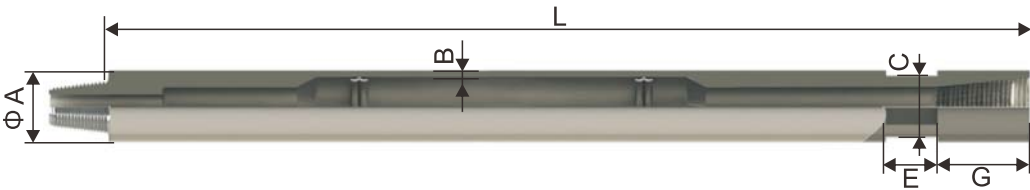
Petroleum pipes



外径(mm)	壁厚(mm)	有效长度(mm)	扳手槽尺寸(mm)	扳手槽长度(mm)	扳手尺寸(mm)	连接螺纹
$\overset{OD}{A}$ $A1$	Wall B	Length L	Across Flat C	Flat Length E	Across Flat G	Connection P/N
85.7 60	7.0	6000	—	—	—	2 $\frac{3}{8}$ " IF
104.8 73	9.0	6000	—	—	—	2 $\frac{7}{8}$ " IF
120.6 89	6.5	9000	—	—	—	3 $\frac{1}{2}$ " IF
120.6 89	9.5	9000	—	—	—	3 $\frac{1}{2}$ " IF
127.0 89	9.5	9000	—	—	—	3 $\frac{1}{2}$ " IF
127.0 89	11.5	9000	—	—	—	3 $\frac{1}{2}$ " IF

水井钻机用钻杆

Schramm T64 Style Drill Pipe



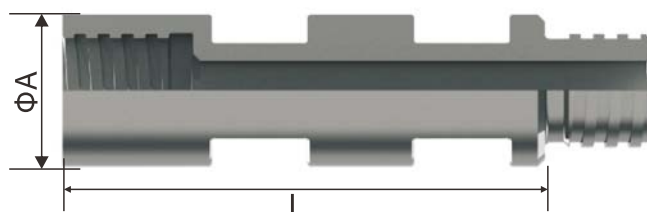
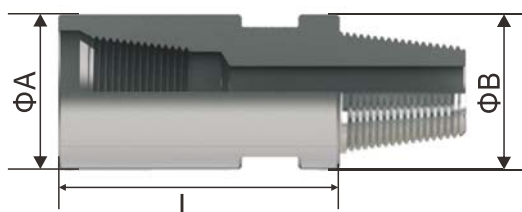
外径(mm)	壁厚(mm)	有效长度(mm)	扳手槽尺寸(mm)	扳手槽长度(mm)	尺寸(mm)	连接螺纹
OD A	Wall B	Length L	Across Flat C	Flat Length E	Dist From Shoulder G	Connection P/N
114	8.5	6000	98	51	95	3 $\frac{1}{2}$ " REG
114	8.5	6000	45	51	57	3 $\frac{3}{4}$ " REG

转换接头

Adapters

内外接头

Box-pin adapters



螺纹 API Threads		扳手槽 Wrench flats	长度 Length	直径 Dia. (mm)		单重 Weight	件号 Part No.
内 Box	外 Pin	(mm)	(mm)	A	B	(kg)	
2 $\frac{3}{8}$ " REG	2 $\frac{3}{8}$ " REG	65	140	77	77	4.0	JT2-1010-140065
2 $\frac{3}{8}$ " REG	2 $\frac{3}{8}$ " REG	65	140	90	90	5.5	JT2-1010-140065-A
2 $\frac{3}{8}$ " REG	2 $\frac{3}{8}$ " IF	65	144	90	90	5.5	JT2-1011-140065
2 $\frac{3}{8}$ " REG	2 $\frac{7}{8}$ " REG	65	130	95	95	8.0	JT2-1020-130065
2 $\frac{3}{8}$ " REG	3 $\frac{1}{2}$ " REG	95	120	90	102	10.5	JT2-1030-120095
2 $\frac{3}{8}$ " IF	2 $\frac{3}{8}$ " REG	65	164	90	90	6.8	JT2-1110-164065
2 $\frac{7}{8}$ " REG	2 $\frac{3}{8}$ " REG	65	154	90	90	6.5	JT2-2011-154065
2 $\frac{7}{8}$ " REG	3 $\frac{1}{2}$ " REG	95	120	90	115	11	JT2-2030-120095
3 $\frac{1}{2}$ " REG	2 $\frac{3}{8}$ " REG	95	219	115	90	12.5	JT2-3010-219095
3 $\frac{1}{2}$ " REG	2 $\frac{3}{8}$ " IF	95	160	115	115	10.5	JT2-3011-160095
3 $\frac{1}{2}$ " REG	2 $\frac{7}{8}$ " REG	95	160	115	115	10.8	JT2-3020-160095
3 $\frac{1}{2}$ " REG	2 $\frac{7}{8}$ " IF	95	160	115	115	10.8	JT2-3021-160095
3 $\frac{1}{2}$ " REG	3 $\frac{1}{2}$ " REG	95	160	115	115	10.5	JT2-3030-160095
3 $\frac{1}{2}$ " REG	4 $\frac{1}{2}$ " REG	120	132	115	146	16.0	JT2-3040-132120
4 $\frac{1}{2}$ " REG	3 $\frac{1}{2}$ " REG	95	235	146	115	17.0	JT2-4030-235095
F48	F42	40	203	59	59	4.6	JT2-7060-203040
F48	F48	40	203	59	59	5.0	JT2-7070-203040
F48	2" REG	40	203	59	59	5.2	JT2-7080-203040

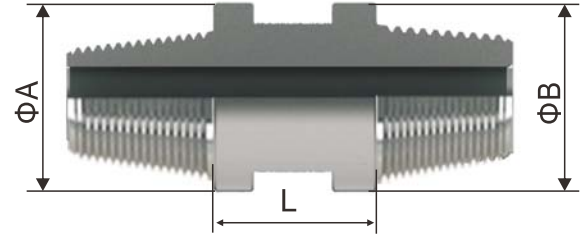
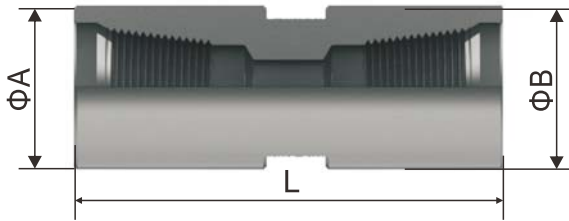
转换接头

Adapters

内接头 外接头

Box-Box adapters

Pin-Pin adapters



螺纹 API Threads		扳手槽 Wrench flats	长度 Length	直径 Dia. (mm)		单重 Weight	件号 Part No.
内/内 Box/Box	外/外 Pin/Pin	(mm)	(mm)	A	B	(kg)	
2 ³ / ₈ " REG / 2 ³ / ₈ " REG	—	65	200	77	77	4.5	JT1-1010-200065
2 ³ / ₈ " REG / 2 ³ / ₈ " REG	—	65	200	90	90	5.8	JT1-1010-200065-A
2 ³ / ₈ " REG / 2 ³ / ₈ " IF	—	65	220	90	90	6.0	JT1-1011-220065
2 ³ / ₈ " REG / 2 ⁷ / ₈ " REG	—	65	225	90	90	6.2	JT1-1020-225065
2 ³ / ₈ " REG / 2 ⁷ / ₈ " IF	—	65	220	90	90	6.0	JT1-1021-220065
2 ³ / ₈ " IF / 3 ¹ / ₂ " REG	—	95	210	90	115	10.5	JT1-1130-210095
2 ³ / ₈ " IF / 2 ³ / ₈ " IF	—	65	230	90	90	6.2	JT1-1111-230095
2 ³ / ₈ " IF / 6 ¹ / ₂ " REG	—	171	260	180	114	21.0	JT1-1160-260171
2 ³ / ₈ " IF / 7 ¹ / ₂ " REG	—	180	270	205	120	28.2	JT1-1170-270180
3 ¹ / ₂ " REG / 2 ³ / ₈ " IF	—	95	200	115	90	9.0	JT1-3011-200095
3 ¹ / ₂ " REG / 2 ⁷ / ₈ " REG	—	95	230	115	90	10.0	JT1-3020-230095
3 ¹ / ₂ " REG / 2 ⁷ / ₈ " IF	—	95	220	115	115	10.0	JT2-3021-220095
3 ¹ / ₂ " REG / 3 ¹ / ₂ " REG	—	95	220	115	115	10.5	JT2-3030-220095
3 ¹ / ₂ " REG / 4 ¹ / ₂ " REG	—	120	240	115	146	18.0	JT2-3040-240120
—	2 ³ / ₈ " REG / 2 ³ / ₈ " REG	65	70	90	90	5.0	JT3-1010-070065
—	2 ³ / ₈ " REG / 3 ¹ / ₂ " REG	95	97	90	115	9.0	JT3-1030-097095
—	3 ¹ / ₂ " REG / 3 ¹ / ₂ " REG	95	90	115	115	10.0	JT3-3030-090095

扳手和拆卸台

Wrenches and Hammer breakout equipment

钻管扳手

Wrenches for drill pipes



扳手槽 B	件号
Wrench flats B	Part No.
28	BS1-028
40	BS1-040
57	BS1-057
65	BS1-065
75	BS1-075
95	BS1-095
102	BS1-102
120	BS1-120
140	BS1-140

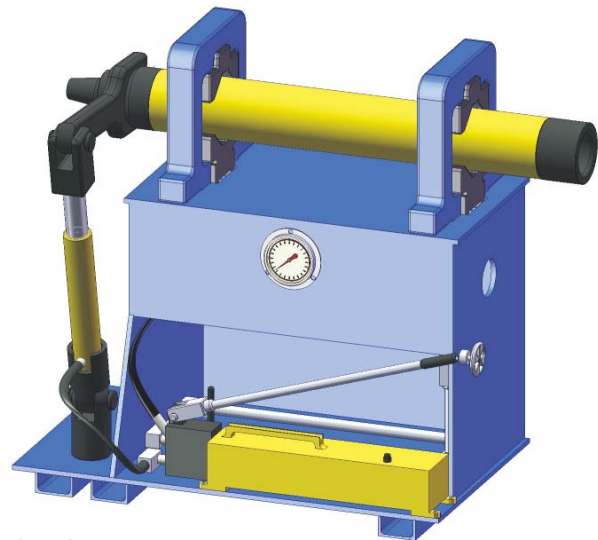
扳手槽 B	件号
Wrench flats B	Part No.
40	BS2-040
57	BS2-057
65	BS2-065
75	BS2-075
95	BS2-095
102	BS2-102
120	BS2-120

CX-4/5" 液压拆卸工作台

CX-4/5 "hydraulic Breakout Equipment

冲击器拆卸工作台使用方法

- 1.把冲击器放进拆卸器里面。
- 2.调节冲击器和扳手的位置，使扳手卡住接头方口处并与千斤顶处于同一平面内。
- 3.将手动泵换向阀扳至水平位置，然后缓慢摇动千斤顶把手，至液压表指针为65Mpa时，停止摇动。
- 4.将截止阀扭紧。
- 5.将手动泵换向阀扳至竖直位置，然后缓慢摇动千斤顶把手，将冲击器慢慢卸开。
- 6.接头拆卸完后，将手动泵换向阀扳至水平位置，千斤顶回油。
- 7.将截止阀松开。
- 8.将手动泵换向阀扳至竖直位置，压紧冲击器的千斤顶回油。
- 9.接头拆卸完后，重复上述步骤，进行下一个拆卸。



Hammer Breakout Equipment Operation Method

- 1.Laying the hammer between the upper and lower lock block.
- 2.Adjust the position of the hammer and wrench,block the top sub(or driver sub)by corresponding wrench,and ensure the wrench and jack are in the same plane.
- 3.Set the hand pump's directional valve at the horizontal position, slowly shake the jack handle until the hydraulic pressure gauge pointer is pointing at 65Mpa,stop shaking.
- 4.Screw the stop valve.
- 5.Set the hand pump's directional valve at the vertical position;slowly shake the jack handle until the top sub(or driver sub)is loosened.
- 6.After the top sub(or driver sub)is dismantled,set the hand pump's directional valve at the horizontal position,release the wrench jack.
- 7.Release the stop valve.
- 8.Set the hand pump's directional valve at the vertical position,release the compressing jack.
- 9.After the breakout,repeat the above steps for the next work.

Gaode/TND系列冲击器使用与维护

Gaode/TND Hammer Operation and Maintenance

冲击器的使用 Hammer Operation

钻孔过程中气动冲击器的性能能否得到充分发挥，固然与冲击器的设计、制造有很大关系，但与合理操作，与其相应钻杆直径、充足的气压、合理的轴压力、足够大的回转力矩，可调节的旋转速度以及良好排碴和注水等条件也有密切关系。

During drilling, whether the nature and property of a pneumatic DTH hammer can perform to its most definitely depends much on the hammer design and manufacture; however, it is also related to a reasonable operation, drill pipe diameter, adequate air pressure, advisable axial pressure, enough returning torsion moment, adjustable rotating speed, good flushing and water injection etc.

1. 压力与供气量 Air Pressure and Air Supply

气动冲击器的工作效率与压气的压力和供气量有很大关系。前者直接关系到气动冲击器冲击频率与冲击功；后者与排碴速度有关。

试验表明，提高压气压力，能使得钻孔速度大大提高。同时，气动冲击器及钻头寿命能大大提高。加大风量可保证排除岩碴所需的返回气流速度，因此，为及时排碴避免重复破碎，提高凿岩效率和钻头寿命，也必须有充足的压气供应。

The working efficiency of a pneumatic hammer is highly relevant to the air pressure and the air quantity supplied. The former directly influences hammer's impacting frequency and power; while the latter affect the flushing condition. Tests show that the higher air pressure provided, the faster the penetration is, meanwhile, hammer and bit life is relatively improved. A larger quantity air supply could guarantee a returning air flushing speed when blowing the cuts. So in order to avoid a second crush and to improve drilling efficiency and to increase bit life, sufficient air should be supplied.

2. 轴压力 Axial Pressure

根据经验气动冲击器通常仅需保持与钻头接触的轴向压力，加大轴压力不能明显提高钻孔速度。

As a rule of thumb, a pneumatic DTH hammer normally only need to keep an axial pressure on the contacting face of bit, increased axial pressure can't distinctively enhance the penetration speed.

3. 旋转速度 Rotation Speed

旋转速度可根据不同岩种和地质情况加以调整。

Rotation speed can be adjusted according to different rock formation and various geological conditions.

4. 注水 Water Injection

在凿岩过程中将水注入压气流中是防止粉尘飞扬，但是，注水对钻速和钻具寿命无益。

During penetration, injecting water is to avoid dust pollution; however, water injection does no good for rotation speed and drill equipment service life.

冲击器的润滑 Lubrication

由于活塞冲击频率高，要求零件之间公差配合严密，如果润滑不足产生摩擦和热量使零件表面产生微小裂缝，导致零件报废。冲击器润滑是十分重要的。

Under the condition of high frequency impacting, the tolerances between parts are strictly limited. The generating of friction and heat resulted by insufficient lubrication easily lead to cracks on part surfaces, which finally turn to part failures. Lubrication is extremely important for a hammer.

1. 冲击器的润滑目的 Function of Lubrication

- a. 减少运动件的摩擦 Reduce friction wear of moving parts
- b. 防腐蚀作用 Avoid Corrosion
- c. 密封作用 Air seal

2. 对润滑油质量的要求 Requirement for Lubricating Oil Quality

- a. 具有高的液膜强度 High Film Strength
- b. 不能有烟雾或毒气排除 No smog or toxic gas elimination

Gaode/TND系列冲击器使用与维护

Gaode/TND Hammer Operation and Maintenance

- c. 任何条件下无腐蚀现象 No corrosion in any conditions
- d. 能很快润滑所有部件 Fast lubricating of all parts
- e. 在高钻速、高温、低温情况下充分润滑 Adequate lubricating in high speed drilling, greater and lesser degree conditions
- f. 无论在冷气体或热气体中都不形成胶粘残余物质 No adhesive residues formed in either cold or hot air supplies
- g. 有较高的油性 Quite high oiling property

Gaode/TND系列冲击器拆装

Gaode/TND Hammer Disassembly

1. 冲击器拆卸 Disassemble the hammer



下面拆卸是以前接头、后接头松动开始的，前后接头松动可用拆卸工作台或锤击方法
The disassemble process starts up by loosening drive sub and top sub. Loose the two subs by using a hammer breakout bench or a hammering tool.



a. 从外套管一端拆下后接头
Unscrew the top sub from piston case.



b. 必须注意：
Gaode/TND系列冲击器活塞只能从后接头取出
Note that Gaode/TND hammer pistons can be taken out from the top sub side only.



c. 前接头、钻头、卡环从另一端一块取出
Drill bit and bit retainer ring is disassembled together while unscrewing drivesub from the other side.



d. 从钻头柄部卸下前接头、卡环
Disassemble the driver sub and bit retainer ring from bit shank.

2. 冲击器装配 (Gaode系列) Gaode Hammer assembly



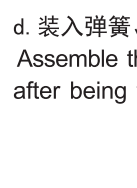
a. 外套管前接头一端将卡圈导入定位后，按此方向装入导向套
Put the collar to its certain position inside the piston case through the driver sub side; assemble the guide sleeve to the orientated location.



b. 前接头、卡环装入，到位后有间隙0.4-0.6mm
Assemble the driver sub and bit retainer ring, there should be a gap of 0.4-0.6mm after being fixed.



c. 活塞、内缸、配气杆装好后，从外套管后接头一端一同垂直导入外套管内、轻击外套管震动落入，再用铜棒敲实
After assembling piston, internal cylinder and rigid valve together, lead them vertically into piston case through the top sub side, slightly tap the piston case to make them fall down, then strike them on the top to fixed position by a copper bar.



d. 装入弹簧、逆止阀、后接头压实后有间隙0.8-1.2mm
Assemble the spring, check valve, and top sub, there should be a gap of 0.8-1.2mm after being fixed.

Gaode/TND系列冲击器使用与维护

Gaode/TND Hammer Operation and Maintenance

冲击器零件磨损失效检测 Hammer parts worn and failure detection



a. 外套管内孔与活塞外径磨损失效间隙 $\geq 0.25\text{mm}$
The wear-out failure gap between piston case internal surface and piston's contacting surface is more than or equals to 0.25mm



b. 活塞末端外径与内缸内孔磨损失效间隙 $\geq 0.25\text{mm}$
The wear-out failure gap between piston upper end and internal cylinder is more than or equals to 0.25mm



c. 配气杆小径与活塞内孔磨损失效间隙 $\geq 0.25\text{mm}$
The wear-out failure gap between rigid valve and piston is more than or equals to 0.25mm



d. 活塞小头外径与导向套内孔磨损失效间隙 $\geq 0.38\text{mm}$
The wear-out failure gap between piston smaller end and guide sleeve is more than or equals to 0.38mm

钻头的修磨 Drill Bit Grinding

合金柱齿钻头虽能“自磨”，但为了得到更高凿岩速度和使用寿命仍然需要进行修磨。钻头损坏形式为边齿磨平和断裂，柱齿脱落等。损坏的钻头如不及时修磨，将会使凿速下降和导致钻头报废。

Although the tungsten carbide bit can be “autogenously grinded”, in order to get a higher penetration speed and longer working life, the buttons need to be sharpened. The main failures of bits include: gauge buttons wear to flat, button cracks or button drop out etc. If the damaged bits are not grinded timely, the penetration speed would decrease and bit tends to worn out easily.

1. 合金柱齿钻头损坏类型 Bit button failures

a. 边齿断裂。虽然个别柱齿断裂仍可继续使用，但会加剧其他柱齿破坏，降低寿命

Gauge button cracks. Although one or two button cracks won't affect a continuous drilling, it would aggravate other buttons' failure and reduce button bit life.

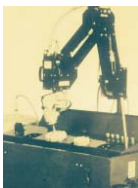
b. 钻头体表面金属或边齿周围金属损坏，常使端面 and 边侧合金柱齿脱落。

Bit body or bit head surface damages usually lead to front buttons and gauge buttons drop out.

c. 由于合金柱齿使用周期过长，合金齿表面出现细微“蛇皮”形网状裂纹。如继续使用，裂纹会蔓延扩大，最终损坏。

Due to too long service life of tungsten carbide, a "snakeskin" patterned cracking might show up on carbide surface. If the bit continues serving, the cracks would expand until a final failure.

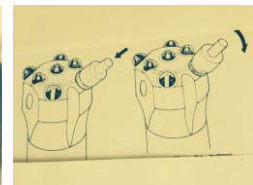
2. 修磨标准 Sharpening Standard



无论修磨标准如何规定，只要发现柱齿变平或出现“蛇皮”网状裂纹，就要修磨。柱齿扁平直径最大极限值为 $D/2\text{mm}$ ，在硬岩中，扁平直径最大极限值小于 5mm

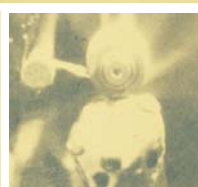
Regardless of any sharpening rules, once button is flat or a "snakeskin" pattern shows up, bit need to be sharpened. The ultimate diameter of flatted carbide is half its original diameter; while in hard formations, it's less than 5mm .

3. 修磨工艺 Sharpening process



a. 合金柱齿修磨。在修磨时，先在合金柱齿扁平中心画一条线，以此线为标记，用风动砂轮将柱齿磨成圆面，然后再将标记线倒圆。砂轮工作转速 $20000\sim 25000\text{转/分}$ 。

Tungsten carbide sharpening. When sharpening, sketch a linear line in the central of the carbide flat face. Under orientation of the linear mark, grinding the carbide sides to round shape by a pneumatic grinding wheel, after that, rounding the carbide along the line. The rotation speed of grinding wheel should be $20000\sim 25000\text{r/min}$.



b. 排渣槽修磨。修磨时不应将金属磨去太多，否则削弱柱齿周围支撑导致脱落。Flushing slot grinding. Bit body metal can't be removed too much; otherwise the support around carbide becomes too weak, which easily result in button drops



值得注意，修磨后边齿斜度以及钻头体金属是否超出边齿外周，如超出应磨掉。Pay more attention to gauge button angles and if bit body metal exceeds the gauge button, the exceeded section should be removed.



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