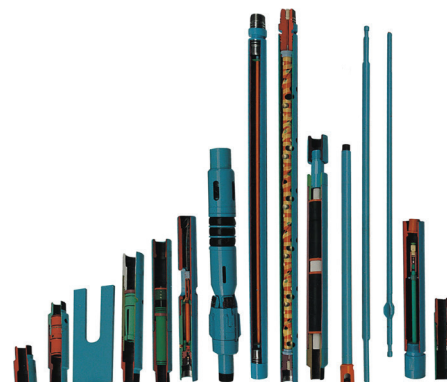


增效射孔枪筒图



Perforating Guns

The testing maximum pressure of the 89mm perforating gun reach 148.5 MPa and maximum temperature is 190.1°C, which is higher than Class D of the industry standard.

Series perforating guns have been used in all Chinese oilfields and have been exported by CNPC contractors to Sudan, Iran, Iraq, Turkmenistan, Kazakhstan, Indonesia, Ecuador, and etc. They enjoy good reputation among customers in the world.

1. Conventional Perforating Guns

Conventional perforating guns include eight series, 30 items and 26 kinds of matched down well tools.

Gun body with blind hole is made by high strength alloy steel and its features are high strength, high toughness, no crack and less deformation after releasing.

Technical parameter

Gun O.D.	89, 102, 114, 127
Gun length	1, 2, 3, 4, 5, 6
Shot density	13, 16, 20, 32, 36, 40
Phase angle	60° , 72° , 90° , 120° , 45° /135° , 30° /150°
Max. pressure resistance	105, 140, 175
Max. temperature	150, 180, 210
Bullet model	YD89,YD102,YD127,DQ114
Bullet arrangement	Right hand
Conveying method	Tubing conveyed & cable conveyed
Firing method	Detonating bar & annulus pressure firing

Major Tools for Perforating Guns

Annulus Negative Pressure Perforating Device

Perforating device firing gun by annulus pressure is used in horizontal well, directional well, thick oil well, high temperature and high pressure well.

Technical parameter

Product Name	Thread Sizes	O.D mm	I.D, mm	Temp. °C	Pressure MPa
Pressure converter	2 7/8TBG.B × 2 3/8UP.TBG.P	93		150	100
Hydraulic negative pressure valve	2 3/8UP TBG.B × P	89		150	100
Screen pipe transmitting pressure device	2 3/8UP TBG.B × P	89		150	100
Larger-bore sealed absorber	2 3/8UP TBG.B × P	100	47	150	100
Pressure differential firing head	2 3/8UP TBG.B × T2 7/8-6ACME.B	86		150	100
Internal pressure firing head	2 3/8UP TBG.B × T3 1/16-6ACME.P	89		150	100

Mechanical Perforating Device

Throw detonating bar from ground to pipeline and ignite detonator and gun strings. It is suitable to full bore pipe operation.

Technical parameter

Product Name	Thread Sizes	O.D, mm	I.D, mm	Temp. °C	Pressure, MPa
95 mechanical firing head	2 3/8UP TBG.B × T2 7/8-6ACME.B	95	34	150	100
2 7/8 firing head	2 3/8UP TBG.B × T2 7/8-6ACME.P	89	34	150	100

Other Major Tools for Perforating Guns

Other major tools include detonating cutter, slide detonating cutter, closing in tong, gun installation frame (paired use), shot installation frame (paired use), shot frame alignment device, thread-protector wrench, crescent wrench.

Cable perforating gun tool: 50-159 conventional cable detonating head, detonator connector, charge carrier, 2" cable firing head, 2" magnetic side support, 13/4" cable jar.

2. Horizontal Well Perforating Gun

New type horizontal perforating gun is our newly developed product which can meet perforation work in horizontal wells. It can be used for direction perforation for long well section and deep wells of perforation and DST combination, perforating for horizontal wells and compound perforation can be obtained.

Horizontal well perforating gun has following functions: with 95 mechanical firing head, 2 7/8 sand prevention firing head and detonating firing head; the temperature resistance is 150°C; the pressure resistance is 105Mpa. There are OD95 and OD 89 specification, 2 3/8"UP. TBG.B × 3 1/16"-6ACME.B and 2 7/8"TBG.B × 3 1/16" -6ACME.P two kinds of end thread to choose.

Technical features

Internal rotation directional type is main methods of horizontal well perforating.

Structure designed to prevent backing thread, twisting blasting fuse.

With positive or negative pressure detonating ways, the perforating gun can be used for combination of horizontal well perforating and test.

The perforating gun head can be repeated used. And roller gun breech can reduce the friction during releasing the guns.

3. Full Bore Perforating Gun

Full bore perforating gun can automatic ally throw the core of detonator and inner parts of gun string into sack gun in the tail after finishing TCP operation under negative pressure conditions. It makes inner gun hollow (full bore) and operation, such as well logging, pressure crack, acidification, MFE, can be done without second pollution caused by kill well following up and down gun string.

Technical parameter

Name	Specification for horizontal well perforating	Full bore perforating gun
Gun O.D. mm	89、102、114、127	89、102、114、127
Length, m	1、2、3、4、5	1、2、3、4、5
Shot density/m	12~16	16~20
Phase angle, α	90°、120°、150°、170°、180°	60°、90°
Pressure resistance, MPa	105、140	105、140
Max. temperature, °C	150、180、210	150
Bullet type	Series bullet specification	Max. drift diameter \geq 60mm
Conveying method	Tubing conveyed	Tubing conveyed
Firing method	Hydraulic detonating	Detonating bar

4. Compound Perforating Gun

Compound perforating gun combines the perforating hole by perforating bullet with the fracturing mode by high pressure air on the basis of conventional cumulative perforating process and improves the formation osmosis in the near perforating area, increases the diversion ability in near well. The body of gun is made of high quality alloy upset tube, and it has high strength, high flexible, so that solve the contradiction between the stick energy and gun expansion, the gun adapt the structure of blind hole and stepped hole.

CNPC produce series compound perforating guns ranging from Φ 89- Φ 127 mm. It has a lot of feature of conventional operation, safety, reliability, anti-high pressure and temperature, more flaw, increasing large production. it makes the oil field gain the significant increasing production and economic efficiency. It can be used for cable transfer perforation and tubing transfer perforation.

Technical parameter

Gun O.D., mm	89、102、114、127
Length, m	1、2、3、4、5
Shot density/m	13、16
Phase angle, α	60°、90°
Pressure Class, MPa	85、105
Max. temperature, °C	150、180、210
Conveying method	Tubing or cable conveyed
Firing method	Pressure firing or Detonating bar