Full Hydraulic Electro-Hydraulic Hammer



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Company Profile

The electro-hydraulic hammer production base of Ningbo SmartSmith Engineering Technology Co., Ltd. was formerly a state-owned Haian Forging Equipment Factory which was founded in 1952. It was a designated forging equipment manufacturer of the former Ministry of Machinery of PR China. It has more than 70 years of experience in forging machinery production. At present, it mainly focuses on professional development and production of full-hydraulic electro-hydraulic hammer. Since the first generation of electro-hydraulic hammer was successfully developed in 2008, it has developed into the fifth generation of electro-hydraulic hammer. Adhering to the concept of "creation, innovation, rigorousness and pragmatism", and through continuous improvement of the design team, great technological breakthroughs have been made in the research of full-hydraulic electro-hydraulic hammer. The new full-hydraulic electro-hydraulic hammer with independent intellectual property rights has unique features in design concept, hydraulic principle, safety performance, strike energy, maintenance and other aspects, and its product performance is far superior. It is especially suitable for the modernization innovation of the old steam (air) hammer. Our strong technical team integrates the capabilities of other production bases of the company and can provide advanced integrated forging solutions for customers. 。

The whole production base covers an area of 28,000 square meters, more than 8,000 square meters of production plant and 10.88 million RMB of registered capital. Regarding technology, the company cooperates with well-known forging research institutes in China and establishes R&D centers to provide professional support for product technological improvement and upgrading. The company has 3 national invention patents and 18 utility model patents, and is a provincial high-tech enterprise.

The series of free forging electro-hydraulic hammer products produced our production base include two categories as CZ61 series full hydraulic single-arm electro-hydraulic hammer and CZ66

series full hydraulic double-arms electro-hydraulic hammer. The series of die forging electro-hydraulic hammer include two categories as CM92K series CNC full hydraulic Die forging hammer and CM86 series full hydraulic die forging hammer. The company focuses on scientific and technological innovation, and is committed to creating value for customers with the best product quality and excellent after-sales service. The products have been rated as provincial superiors many times, and have provided more than 50 types of electro-hydraulic hammers to the market. At present, it ranks second in the domestic electro-hydraulic hammer industry and gradually catches up with competitors. Our customers cover ship transportation, automobile manufacturing, hardware and other industries. In recent years, we have exported to South Korea, Indonesia and other countries, and actively promoted to Russia and India market.







Development History

Haian Forging Machine Tool Factory was established in 1952. It began to imitate foreign air hammers and produced 40 kg air hammers.

The first 750KG air hammer was produced in 1968.

The first 2-ton fully hydraulic rail forging operator was produced in 1972.

The first 63KG fuselage fretting hydraulic counter hammer was produced in 1974.

The first hydraulic die forging hammer with vibration attenuation was produced in 1988.

The first 1- ton air hammer was produced in 1999.

The first 3-ton electro-hydraulic hammer was produced in 2005

The first 2-ton air hammer was produced in 2008

In 2017, Ningbo Smart Smith Engineering Technology Co., Ltd. was established to integrate the resources of various shareholders in the forging industry chain, and began overseas promotion of the company's full hydraulic electro-hydraulic hammer series products and got initial results.



Patent



Product Introduction

Brief Introduction of Full Hydraulic Electro-Hydraulic Hammer Series



Full hydraulic electro-hydraulic hammer is a new type of forging equipment with energy saving and environmental protection. It can be divided into free forging electro-hydraulic hammer and die forging electro-hydraulic hammer according to their functions. Our company's free forging electro-hydraulic hammer series products include C61 series full hydraulic single-arm electro-hydraulic hammer and C66 series full hydraulic double-arm electro-hydraulic hammer. Die forging electro-hydraulic hammer series products include C92K series CNC full hydraulic die forging hammer and C86 series full hydraulic die forging hammer.

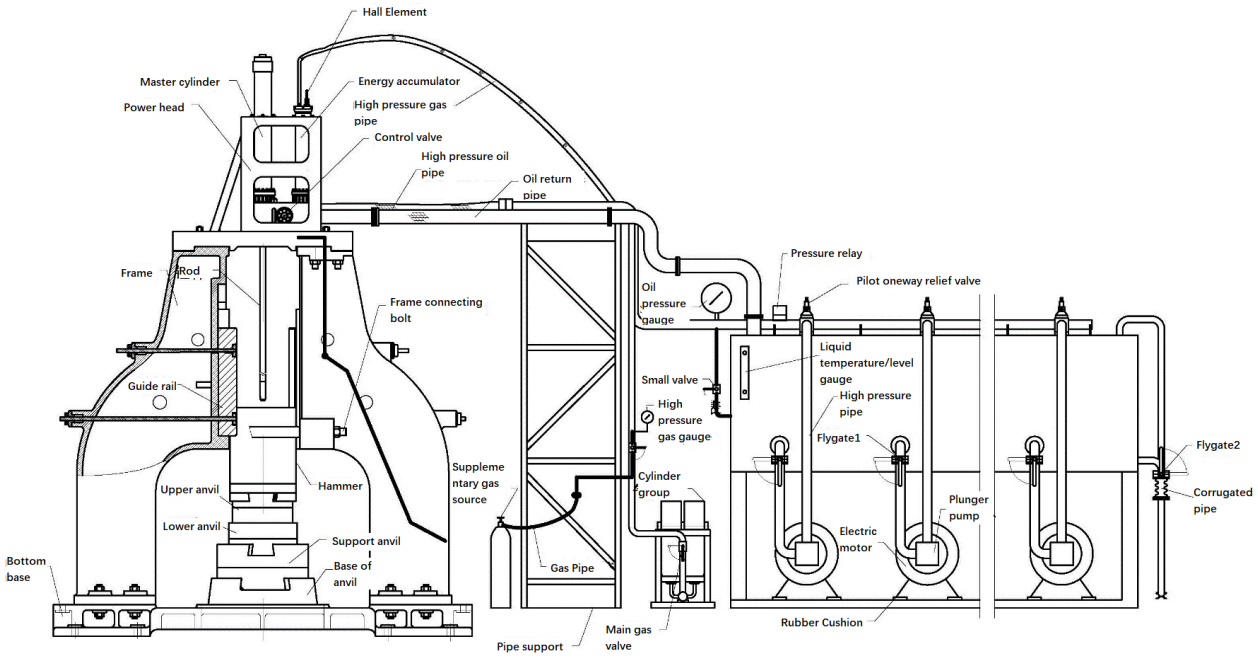
Our company's full hydraulic electro-hydraulic hammer adopts the form of separating the main engine from the hydraulic station, that is, the full hydraulic power head is installed on the machine body, the hydraulic station is placed on the ground, and the power head and the hydraulic station are connected by pipes. Its main characteristics are as follows:

- The operation of forging hammer achieves free and flexible movement of light hit and effective control of energy of heavy hit, which greatly improves the reliability and adaptability of the work of forging hammer.
- NC full hydraulic electro-hydraulic die forging hammer can realize programmed automatic strike and programmed forging of work piece.
- The structure of the power head is simple and the failure rate is low. Adopt tubeless design, eliminate the phenomenon of oil and gas channeling and no leakage.
- The hammer head can be slowly lifted and slowly lowered, the hammer head can be stopped at any position, and the operation of replacing the die is safe, convenient and fast.
- X-type guide rail has high forging precision and long life of hammer rod.
- The power head adopts internal hydraulic cushioning design, which is more safe and reliable.
- Stroke energy is large, energy control is accurate, strike speed is fast, easy to operate and labor intensity is low.
- Hydraulic system works smoothly, has low noise, saves energy and reduces consumption.

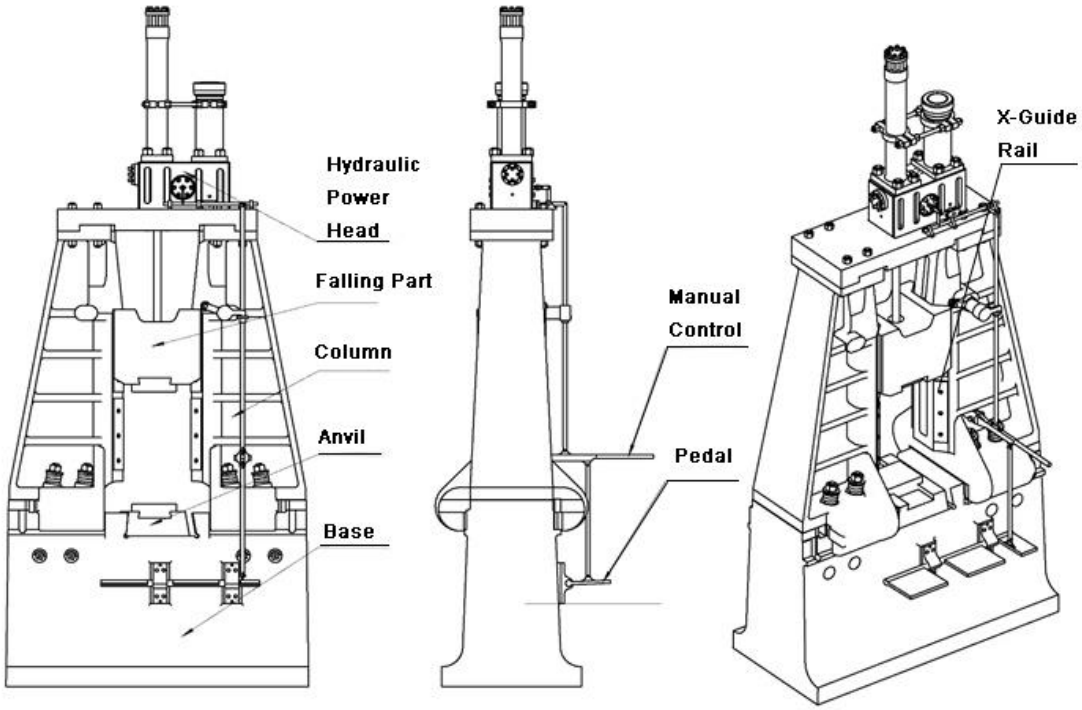
Therefore, our company's full hydraulic electro-hydraulic hammer is suitable for low carbon production, low hammer operation cost production, high efficiency production and other modern forging industry requirements. It is widely used in the mass production of forgings in automobile, tractor, agricultural equipment, petroleum and natural gas industry, power station, motor and other industries. It is also particularly suitable for the modernization innovation of the old steam (air) hammer.

Basic Structure of Full Hydraulic Electro-Hydraulic Hammer

A. Open die forging



B. Die forging (Display host machine only)



Hydraulic Single Arm Electro-Hydraulic Hammer

Performance characteristics:

- Strong impact force, fast strike speed, accurate control of strike energy;
- The power head adopts tubeless integrated valve body, which has simple structure and low failure rate, avoid oil and gas channeling.
- Achieve the hammer actions as hit, return, slow up, slow down and hang at any position.
- Multiple strike modes, light operation and low labor intensity of workers.
- Flexible design of hammer rod, more than double life.
- Filled with hydraulic oil in all cavities of master cylinder, the working environment of its seals has been greatly improved, and the service life were longer.
- Low energy consumption, low noise, energy saving and environmental protection.



Parameters of C61 series single arm electro-hydraulic hammer

设备型号 Model / 参数名称 Item	单臂全液压自由锻电液锤 Single Arm Fully Hydraulic Open Die Forging Hammer									
	C61Y-30 **1T**	C61Y-45 **1.5T**	C61Y-75 **2T**	C61Y-125 **3T**	C61Y-150 **4T**	C61Y-180 **5T**	C61Y-220 **6T**	C61Y-280 **8T**	C61Y-340 **10T**	C61Y-420 **12T**
打击能量（KJ) Hit energy	30	45	75	125	150	180	220	280	340	400
落下部分重量（Kg) Weight of the falling part	1000	1500	2500	3200	4200	5500	6500	8500	11000	12500
设计行程(mm) Design stroke	910	1100	1150	1350	1400	1850	1900	1900	2200	2200
锤身间距(mm) Distance to harmmer body	570	800	860	960	1100	1200	1200	1400	1400	1400
工作间距(mm) Work distance	1560	1850	1910	2210	2210	2220	2220	2300	2570	2570
下砧高度(mm) Lower anvil height	720	720	720	750	750	800	800	850	900	900
油泵型号 Oil pump Model	A2F160R2P3									
蓄能器尺寸 (mm) Accumulator size	ø180	ø180	ø180	ø220	ø220	ø220	ø220	ø220	ø250	ø250
打击频次(次/分钟) Strike frequency(/minute)	75	70	75	65	65	60	50	50	45	54
主电机(KW) Main motor	55X1	75X1	55X2	55X3	55X4	55X5	55X5	55X6	55X8	55X9
油箱容积(M^3) Tank volume	2.7	2.7	3	4.5	5	7	7	8	9	9
砧座总成重量(Tons) Total weight of the anvil assembly	10	15	20	35	45	60	70	100	130	150

Full Hydraulic Double Arm /Bridge type Electro-Hydraulic Hammer



Performance characteristics:

- Strong hit force, fast speed, accurate control of hit energy;
- The power head adopts tubeless integrated valve body, which has simple structure and low failure rate, avoid oil and gas channeling.
- Patented operation valve can achieve the actions as heave hit, light hit, slow down, hammer hanging, etc.
- Unique design on cushion valve can eliminate the hydraulic impact of stop and fast returning actions of hammer, reduce shock.
- Flexible design of hammer rod, life more than doubled;
- Multiple hit modes, easy operation and low labor intensity of workers.
- The seals of master cylinder work in oil-immersed state, the service life was longer.
- Low energy consumption, low noise, energy saving and environmental protection.

Parameters of C66 series full hydraulic double-arm/bridge type electro-hydraulic hammer:

设备型号 Model / 参数名称Item	双臂全液压自由锻 Fully Hydraulic Open Die Forging Hammer											桥式全液压自由锻 Fully Hydraulic Open Die Forging Hammer(Bridge Type)					
	C66Y-45 1.5T	C66Y-80 2.5T	C66Y-155 3T	C66Y-155 4T	C66Y-180 5T	C66Y-210 6T	C66Y-260 8T	C66Y-310 10T	C66Y-450 14T	C66Y-450 16T	C66Y-450 18T	C66-195 5T	C66-230 6T	C66-295 8T	C66-350 10T	C66-400 12T	C66-490 14T
打击能量（KJ) Hit energy	45	80	135	155	200	220	280	320	450	580	620	195	230	295	350	400	490
落下部分重量（Kg) Weight of the	1500	2700	3500	4500	5500	6500	9000	11000	14000	20000	24000	6000	7000	9500	11500	14000	16000
设计行程(mm) Design stroke	1200	1350	1450	1500	2000	2100	2150	2200	2300	2300	3000	2000	2150	2200	2300	2400	2600
锤身间距(mm) Distance between	1900	2400	2800	2800	4000	4000	4750	4750	5000	5000	5000	4100	4100	4300	4500	4500	6000
工作间距(mm) Work distance	1400	1550	1470	1470	2000	2100	2370	2370	2700	2800	3000	2200	2300	2400	2500	2800	3000
下砧高度(mm) Lower anvil height	750	720	750	750	750	800	900	900	1000	1000	1000	750	800	850	850	1000	1000
油泵型号 Oil pump Model	A2F160R2P3											A2F160R2P3					
蓄能器尺寸 Accumulator size	Ø180	Ø180	Ø220	Ø220	Ø220	Ø220	Ø220	Ø250	Ø250	Ø300	Ø300	Ø220	Ø220	Ø250	Ø250	Ø300	Ø300
打击频次(次/分钟) Strike	70	70	65	60	60	60	50	50	45	40	40	55	50	50	45	45	45
主电机(KW) Main motor	55X1	55X2	55X3	55X3	55X4	55X5	55X7	55X8	55X11	75X14	75X16	55X5	55X5	55X7	55X9	55X10	55X12
油箱容积(M^3) Tank volume	2.5	3	4.5	4.5	5	6.5	8.5	9.5	12	14	16	6.5	6.5	8.5	9.5	10.5	12
砧座总成重量(t) Total weight of the anvil assembly	15	30	45	55	75	90	120	150	220	265	300	75	90	120	150	180	220

CNC Full Hydraulic Die Forging Hammer

Performance characteristics:

- The digital control of strike energy can be adjusted within a certain range to meet the requirements of precision forging.
- The hitting program is programmable, the hitting frequency is high, the hammer returns quickly, and there is no stuck phenomenon of forging die.
- Integral U-shaped cast steel frame, radial X-guide rail structure, good accuracy of hammer guidance;
- Programmed control, digital input, convenient man-machine dialogue, automatic diagnosis of fault diagnosis system;
- The power head adopts tubeless integrated valve body, which has simple structure and low failure rate, avoid oil and gas channeling.
- High precision of forging and long service life of hammer and die.



Parameters of C92K series full hydraulic NC die forging hammer

设备型号 Model / 参数名称Item	数控全液压模锻锤 Numerical control hydraulic die forging hammer														
	C92K -6.3	C92K -8	C92K -10	C92K -12.5	C92K -16	C92K -20	C92K -25	C92K -31.5	C92K -40	C92K -50	C92K -63	C92K -80	C92K -100	C92K -125	C92K -160
打击能量(KJ) Hit energy	6.3	8	10	12.5	16	20	25	31.5	40	50	63	80	100	125	160
落下部分质量(Kg) Rated wight of the falling part	430	540	680	860	1080	1350	1700	2150	2700	3400	4300	5400	6800	8500	10800
最大打击频次(/min) Max hit number	152	145	138	129	122	123	113	100	98	98	98	92	81	70	70
打击行程(mm) Hit stroke	380~555	395~570	405~580	420~620	435~635	455~665	470~685	490~755	510~790	530~775	550~805	570~835	595~885	615~920	640~960
工作油压(Mpa) Oil Work Pressure	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20
主电机功率(Kw) Main motor Power	30	30	30	37	45	55	75	75	90	2x75	2x75	2x90	2x90	2x110	3x90
整机质量(kg) Machine weight	15000	15000	15000	19000	24000	30000	41000	46000	58000	80000	94000	11600	14100	18900	23500

Full Hydraulic Die Forging Hammer



Performance characteristics:

- The power head adopts tubeless integrated valve body, which has simple structure and low failure rate, avoid oil and gas channeling.
- Unique design on cushion valve can eliminate the hydraulic impact of stop and fast returning actions of hammer, cushion and reduce shock.
- Patented operation valve can achieve the action of heave hit, light hit, slow down, hammer hanging, etc.
- Flexible design of hammer rod, life more than doubled.
- The hammer head can be slowly lifted and slowly lowered, and the operation of replacing the die is safe, convenient and fast.
- High precision of forging and long service life of hammer and die.

Parameters of C86 series full hydraulic die forging hammer

设备型号 Model / 参数名称Item		模锻全液压电液锤 Full hydraulic die forging hammer						
		C86-35 (1T)	C86-60 (2T)	C86-85 (3T)	C86-145 (5T)	C86-200 (8T)	C86-250 (10T)	C86-400 (16T)
最大打击能量(KJ) Maximum strike energy		＞35	＞60	＞85	＞145	＞200	＞250	＞400
落下部分质量(Kg) Falling part mass		1500	2500	3500	6000	8600	10500	16300
打击频次(min－1) Hit Frequency		7秒≥7锤	7秒≥7锤	7秒≥7锤	8秒≥8锤	8秒≥8锤	8秒≥8锤	8秒≥8锤
最大行程(mm) Maximum stroke		1000	1200	1250	1300	1350	1400	1500
导轨间距(mm) Distance between guide		540	600	700	740	900	1000	1200
最小闭模高度(不含燕尾)(mm) Min. height(excluding dovetail)		220	260	350	400	430	450	500
外形尺寸(mm) Shape size (L*W*H)		2400 *1400 *6000	3000 *1700 *6500	3200 *1500 *7100	3700 *2100 *8600	4300 *2700 *11200	4400 *2700 *12000	4500 *2600 *13100
油箱外形尺寸(mm) Shape size of oil tank		2000 *1500 *1300	2700 *2000 *1600	2700 *2000 *1600	3600 *1200 *1600	4500 *2000 *1600	5400 *2000 *1500	7200 *2000 *1600
主油泵型号 Main oil pump model		A2F160R2P3	A2F125R2P3	A2F160R2P3	A2F160R2P3	A2F160R2P3	A2F160R2P3	A2F250R2P3
主电机 Main motor	型号 Model	Y225M-4-B35	Y225M-4-B35	Y250M-4-B35	Y250M-4-B35	Y250M-4-B35	Y250M-4-B35	Y280M-4-B35
	功率(KW) Power	55 x 1	55x1	55x2	55 x 3	55x3	55x4	75x5
冷却油泵型号 Type of cooling oil pump		KCB-200	KCB-200	KCB-300	KCB-483.3	KCB-633	KCB-960	2*KCB-633
冷却电机功率(KW) Cooling motor power		4	4	5.5	7.5	7.5	7.5	7.5

Note: Due to the continuous improvement and development of our products, the structure and parameters of our products are subject to change without notice. The specific technical parameters are subject to documents provided with equipment. If you have any questions, please contact our technical support.



Processing and assembly site of our company

Upgrading by Full Hydraulic Power Head

Our company's full hydraulic hammer power head system includes full hydraulic power head, hydraulic station, gas cylinder group, electrical control cabinet and corresponding oil and gas connection pipeline. It is suitable for the upgrading of steam hammer, pneumatic hammer and old hydraulic hammer. By retaining the anvil block and the hammer frame of the original hammer, reforming the X guide rail and installing a new full hydraulic power head system, the old hammer becomes a full hydraulic hammer with advanced performance, small investment, short cycle and high benefit.



Full hydraulic power head



R&D process

The advantages after upgrade and transformation are as follows:

1. Hit energy is large, hit speed is fast and frequency is high.

Using 12.5-14 MPa high pressure oil, personalized design can be used to increase the impact energy by more than 20% on the basis of the original hammer, and the speed is fast. Short stroke design can be used to achieve higher strike frequency.

2. Simple structure, the failure rate is very low and the maintenance is convenient.

The power head adopts tubeless integrated valve body, which has simple structure, low overall maintenance frequency and avoid oil and gas channeling.

3. Low energy consumption, energy saving and environmental protection.

Accurate impact energy control and advanced hydraulic system design greatly reduce the noise and energy consumption of forging hammer.

4. Light operation, low labor intensity and low cost.

There are a variety of strike modes, responsive, programmable strike can be achieved, easy to operate, reduce the labor intensity of workers. Cancel air compressor, reduce maintenance cost and manpower.

5. High safety.

The power head has a special shock absorption system, which greatly reduces the impact force of the hammer when it returns quickly. Multiple safety designs in whole hydraulic system.

6. Upgrading cycle is short, investment is small and benefit is high.

Upgrading of steam/air forging hammer with power head for full hydraulic hammer saves time and money, and reduces energy consumption by 40-50% compared with the original hammer. The number of motor units put into operation can be selected according to the working conditions, which is more energy-saving and benefit obviously.

Contrast Table of Electro-hydraulic Hammer and Traditional Hammer		
Serial No.	Steam/air hammer	Full hydraulic electric hydraulic hammer
1	Energy efficiency is 1-3%, even as low as 0.2%. High cost.	Energy efficiency reach 20%-30%. Low cost.
2	Using coal (or electricity) as energy source, compressed steam (or air) as medium	Using electricity as energy source, hydraulic oil as medium
3	The hit energy comes from the work done by compressed steam or air and the work done by gravity of the falling part.	The hit energy comes from the work done by high-pressure oil and the work done by gravity of the falling part.
4	Gas leakage	No oil and gas channeling, high service life of hammer rod seal.
5	Shortage and instability of strike energy	Strike Energy is full and stable
6	Big noise, environmentally unfriendly	Small noise, environmentally friendly
7	The air compressor must be opened before opening the equipment.	Start and stop at any time
8	Poor working environment	Good working environment

Customer Site



广东揭阳
全液压模锻电液锤现场图



哈尔滨东安发动机厂
全液压模锻电液锤现场图





江苏省张家港市创奇机械有限公司
5T全液压模锻锤使用现场







出口韩国
全液压模锻电液锤现场图



江苏金刚德有限公司
自由锻电液锤现场图