

SANY HYDRAULIC SUPPORT  
**三一液压支架**

Product Brochure  
**产品手册**

**SANY**



# SANY



## QUALITY CHANGES THE WORLD

Company profiles  
Hydraulic support products  
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Pure water hydraulic support

## Company Profile

Founded in 2004, SANY Heavy Equipment Co., Ltd. is a large construction equipment manufacturer and one of the core business enterprises of SANY Group – a global market pioneer of equipment manufacturing. SANY Heavy Equipment specializes in the research and development, manufacturing and marketing of mining machinery, set of equipment for coal excavation, mining, and transportation. It has more than 50 categories of leading products in the world, such as the off-highway mining truck, dump truck, mining and tunneling machine, hydraulic support, roadheader, drag conveyor, coal cutter, etc.

### Products' Footprints

With 18 years of constantly innovation and moving forward, SANY Heavy Equipment has delivered its products to more than 20 countries and regions such as Russia, India, Indonesia, Brazil, Argentina, Ukraine, Turkey, Mongolia, Poland, South Africa, West Africa, Vietnam, Thailand, the Philippines, etc. It has established 13 domestic subsidiary companies and its 24h sales and services cover 4 continents. SANY Heavy Equipment keeps exploring more possibilities to expand its reach and innovate its way of doing business as well as to raise the standard and answer the call for new market needs.





## Innovation and Research

Consisting of the Research and Development Departments of Excavation, Intelligent Technology, Wide-Body Dump Truck, Purified Water Support, and Coal Cutter, the Research Institute of SANY Heavy Equipment has been recognized as Chinese National Technical Center and High-Tech Enterprise. It has a National Postdoctoral Research Workstation, a first Academician Workstation in industry, a Continental Engineering Center and a Continental Engineer Laboratory. It also has passed the information security certification of CNAS (China National Accreditation Service for Conformity Assessment) and American standard ANAB (ANSI-ASQ National Accreditation Board).

## Working on the Future

SANY Heavy Equipment is a forward-looking company that was born in a time of change and now looks for any opportunity in those changes that will lead the way to the future. It is unleashing the power of data in the connectivity of machines, realizing smart manufacturing and autonomous operation with some models. The efforts to add a new electric product portfolio makes SANY Heavy Equipment stand out in today's digital world and is also part of its sustainable solutions.



# Hydraulic support products

Sany Heavy Equipment hydraulic support products have served more than 300 working faces across the country and exported to Ukraine; the product type spectrum is complete, and it is suitable for various working conditions such as thin coal seam to extra thick coal seam, large dip angle coal seam, and three soft coal seams. Optimized design, support height from 0.66m to 8.0m, support resistance from 2400kN to 21000kN.

Sany Heavy Equipment not only provides conventional hydraulic support products, but also high-strength hydraulic support and pure water hydraulic support products. From 2011 to 2013, the high-strength hydraulic support was successfully developed, and it has served more than 70 working faces in China so far, and its high cost performance is well recognized by customers; from 2014 to 2018, the pure water hydraulic support was successfully developed, and it was the first to be popularized and used in Shandong, not only completely solve the problem of emulsion pollution to achieve green coal mining, and also reduce the cost of emulsion and maintenance and replacement parts, through the appraisal of scientific and technological achievements by industry experts, and won the second prize of scientific and technological progress of China Coal Industry Association.

## product spectrum

type	Support height (m)	Working resistance (kN)	Purpose
Two-column shielding full-height support (ZY)	Minimum height: 0.7 ~ 3.2 Maximum height: 1.7 ~ 8.0	2400 ~ 21000	It is used for one-time mining full-height working face of thin, medium-thick and thick coal seams, with high support strength and high efficiency.
Four-column support cover type mining full-height support (ZZ)	Minimum height: 0.65 ~ 2.5 Maximum height: 1.3 ~ 4.5	3500 ~ 18000	It is used for one-time mining full-height working face of thin, medium-thick and thick coal seams, with large ventilation section, strong impact resistance and strong roof cutting ability.
Two-column shielded top coal caving support (ZFY)	Minimum height: 1.4 ~ 2.3 Maximum height: 2.6 ~ 4.5	4000 ~ 21000	It is used for top coal caving working face in thick coal seam, with high support strength and high efficiency.
Four-column support cover type top coal caving support (ZF)	Minimum height: 1.6 ~ 2.5 Maximum height: 2.6 ~ 4.5	4000 ~ 21000	It is used for top coal caving working face in thick coal seam, with large ventilation section, strong impact resistance and strong roof cutting ability.
Left and right step type end support(ZT)	Minimum height: 1.8 ~ 2.6 Maximum height: 3.2 ~ 5.0	10000 ~ 36000	It is used for transporting galery trough and return air galery trough (intersection with the working face).
Front and rear step type end support(ZT)	Minimum height: 1.8 ~ 2.6 Maximum height: 3.2 ~ 5.0	10000 ~ 36000	It is used for transportation galery trough and return air galery trough (20m ahead of the coal wall).
Trough step forward support (ZQ)	Minimum height: 1.8 ~ 2.6 Maximum height: 3.2 ~ 5.0	10000 ~ 30000	It is used for transportation galery trough and the return air galery trough (20m ahead of the coal wall).
Trough unit support (ZQ)	customize	customizev	It is used for transportation galery trough and return air galery trough (tens to hundreds of meters ahead of the coal wall).
Special Purpose Support	customize	customize	It is used for support retraction in fully mechanized mining face and support when fully mechanized excavation work faces.

QUALITY CHANGES THE WORLD





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## High strength support



## Four main selling points

### Safe and reliable



High strength steel, The safety factor of structural parts is improved by  $\geq 5\%$ .

### Cost-effective



The total tonnage of the working face support is reduced, and the coal mine investment is reduced by 5%.

### Super performance



The performance of lifting the bottom, moving the frame and adjusting the frame is improved by  $\geq 10\%$ .

### Easy to use



It is convenient for moving , Go down well and dismantle less or not even dismantle.

**High strength support**



High-quality material selection + lightweight design reduces weight by 10% compared to conventional support.

**Product description**

**High matching material**

- Introduce high-strength materials for construction machinery into the coal machinery industry. Since 2013, Sany Group's unique SG1000 steel plate has been introduced into hydraulic support products to replace Q690/Q550, achieving high strength, lightweight and weight reduction of 10% for hydraulic supports.

**Lightweight Design**

- It took 3 years and invested 10.8 million yuan to break through lightweight design technology. 12 prototypes were tested for stress and strain with reference to European standards. The theory and practice were repeatedly verified. Experience was summed up to form a theoretical system, applying lightweight technology, a mine 1. Optimize the design, remove the design redundancy, and realize the lightweight of the hydraulic support.

**Product configuration and advantages**

Offload configuration	Configuration instructions	Configuration advantages
Key parts of the structure	High strength steel such as SG1000	High strength, fatigue resistance, safety and reliability
Cylinder anticorrosion	Milky white chrome + hard chrome, copper plating, laser cladding and other processes	The process is mature, stable and corrosion-resistant, and can be adapted to different working conditions
Valve	The valve core and valve body are made of stainless steel	High pressure and corrosion resistance
Seal	The main material is imported polyurethane	Hydrolysis resistance, high pressure resistance, wear resistance
Hose	Made of special synthetic rubber	Impact resistance, fatigue resistance, safety

## Use Cases

Model	Customer name	Lighter
ZFY6800/23/42	Coal mine in Gansu Province	8.00%
ZY3600/08/18D	Coal mine in Guizhou Province	12.50%
ZF8600/22/35	Coal mine in Shanxi Province	8.93%
ZY6800/13/28	Coal mine in Anhui Province	10.81%
ZY9000/25/50	Coal mine in Shanxi Province	10.45%
ZZ6000/17/34	Coal mine in Shanxi Province	10.53%
ZY4200/12/28	Coal mine in Guizhou Province	12.86%
ZY3000/07/17	Coal mine in Shandong Province	17.65%
ZY5000/14/31	Coal mine in Guizhou Province	8.86%
ZY6800/24/50	Coal mine in Shanxi Province	8.33%
ZY5000/14/31	Coal mine in Guizhou Province	14.56%
ZF9000/18/35	Coal mine in Shanxi Province	10.37%
ZF9000/18/35	Coal mine in Shanxi Province	13.68%
Z600/24/50	Coal mine in Shanxi Province	18.57%
ZY9000/26/55	Coal mine in Xinjiang Uygur Autonomous Region	11.76%
ZFY5800/17/32	Coal mine in Xinjiang Uygur Autonomous Region	12.82%
ZY3200/07/17	Coal mine in Shanxi Province	11.11%
ZY3000/14/32	Coal mine in Sichuan Province	19.01%
ZF10000/19/35	Coal mine in Shanxi Province	18.71%
ZF8000/18/35	Coal mine in Shanxi Province	16.98%
ZF10000/18/35	Coal mine in Shandong Province	16.61%
ZF10000/22/35	Coal mine in Shanxi Province	6.72%
ZF12000/18.5/35	Coal mine in Shandong Province	13.75%
ZF15000/24/43	Coal mine in Xinjiang Uygur Autonomous Region	4.55%
ZY4000/14/32	Coal mine in Inner Mongolia Autonomous Region	13.79%
ZF7500/22/38	Coal mine in Shanxi Province	5.14%
ZF6800/17/32	Coal mine in Shandong Province	9.52%
ZF7200/20/33	Coal mine in Shanxi Province	7.32%
ZY5000/16/38	Coal mine in Guizhou Province	5.41%
ZY12000/26/50D	Coal mine in Inner Mongolia Autonomous Region	10.98%
ZY4200/13/28	Coal mine in Yunnan Province	5.19%
ZFY13000/25/42D	Coal mine in Shanxi Province	4.44%
ZY6800/24/50	Coal mine in Shanxi Province	8.33%
ZY6800/22/45	Coal mine in Shaanxi Province	8.52%
ZY7200/13/28D	Coal mine in Shandong Province	9.52%
ZY5200/18/38	Coal mine in Yunnan Province	8.33%
ZY4200/13/28	Coal mine in Yunnan Province	8.57%
ZF10000/19/35	Coal mine in Shanxi Province	18.71%
ZF8000/18/35	Coal mine in Shanxi Province	16.98%
ZY3000/07/17	Coal mine in Shanxi Province	9.41%
ZY7000/24/50	Coal mine in Shanxi Province	8.00%
ZY4000/08/18D	Coal mine in Shanxi Province	13.04%
ZY15000/26/55D	Coal mine in Shaanxi Province	3.33%

# Pure water hydraulic support



## Four main selling points

### Environmental friendly



Completely solve the problem of emulsion pollution and realize green mining.

### Efficient



The failure rate of hydraulic system is reduced by more than 20%, and coal mining is efficient.

### Clean



Closed liquid supply and return system, excellent working environment for hydraulic parts.

### Economy



Save the cost of emulsion, Maintenance and replacement cost reduction > 10%.



**Pure water hydraulic support**



**Influent water quality index**

Influent water quality index	unit	parameter
pH		6~8
Temperature	℃	15 ~ 40
Total hardness (as CaCO <sub>3</sub> )	mg/L	≤650
Total dissolved solids	mg/L	≤1600
Turbidity	NTU	<10
Chloride	mg/L	≤350
iron ion	mg/L	<0.1

**Important parameters**

Project	unit	Parameter
Water production	m <sup>3</sup> /h	≥20
Product water resistivity	MΩ·cm	≥13
Desalination rate	%	≥99
Supply voltage	V	1140
Return water resistivity	MΩ·cm	≥2

**Composition**

- Pure water preparation device
- Pure water high pressure pump station
- Pure water holder
- Scraper, loader, hydraulic system of self-moving tail.

**Technology research and development achievements**

- It took 4 years of research and development (2014 to 2018) to achieve technical results.
- Break through 3 core technologies: water production technology, pure water sealing technology, and anti-corrosion technology for column jacks.
- Apply for 28 patents, including 13 inventions.
- Developed 12 corporate standards and published 13 papers.
- The only company in China to obtain MA certification for pure water production equipment.
- Won the second prize of Science and Technology Progress of China Coal Industry Association.

## Product advantages

### Operation and maintenance cost

- Operating costs – saving 130 tons of emulsified oil per year, saving more than 1 million yuan (demonstration project data).
- Maintenance cost – maintenance and replacement parts are reduced, saving more than 10% of the use of spare parts.
- Overhaul cost – extend the overhaul period of the bracket by 1 year, and only need to replace the seal during maintenance, saving overhaul costs.

### Hydraulic Components

- Develop high-strength corrosion-resistant alloys to improve impact resistance.
- Optimize the drainage diameter and pressure equalizing groove to solve the impact of water hammer and dynamic response.
- By strengthening the wear resistance of the valve core, the problem of high-speed wear of the suction and discharge valve is solved.

### Sealing material

- Developed a sealing material with hydrolysis resistance, good lubricity and high strength.
- Tensile strength:  $\geq 55\text{N/mm}^2$
- Friction coefficient: 0.13
- Shore hardness:  $94 \pm 2\text{A}$ .

## Use Cases

### The first pure water demonstration project

- On August 28, 2018, the 31408 working face of a coal mine started operation, with a cumulative advance of 5,162 meters and production of 6.08 million tons of raw coal. Nissan's highest level is 29,600 tons. The highest monthly output was 681,800 tons, with a monthly average of 480,000 tons.
- On October 18, 2019, the relocation was completed, and it was directly moved to the 31409 working face without major repairs. As of November 20, 2020, the working face was connected, and the accumulated advance was 5085 meters, producing 5.83 million tons of raw coal.



### Pure water preparation device

- The pure water preparation device is arranged on the working surface or fixed chamber.
- High pretreatment capacity and strong adaptability to raw water.
- Using electro dialysis technology and ion exchange technology to make pure water with high resistance value.
- Adopt SPG lifting technology and SQW separation technology to ensure the water quality of the working face is stable.
- Equipped with the return water lifting function to reduce the use of raw water and improve the return water rate of the system.

### Failure rate

- The resistivity of pure water medium is high, and the resistivity of return water ( $25^\circ\text{C}$ )  $\geq 2\text{M}\Omega \cdot \text{cm}$ . The new surface anti-corrosion technology and the application of stainless steel materials prevent rust.
- The failure rate of hydraulic system is reduced by more than 20%.

### Green and Environmentally Friendly

- The pure water medium is non-polluting, safe, clean and clean, realizing zero pollution discharge.
- Responding to the requirements of the national industrial policy, implement the call of "Lucid waters and lush mountains are invaluable assets", and realize the green mining of coal mines.

### The second set of pure water demonstration projects

- On November 20, 2020, the 22411 working face of a coal mine started operation. As of May 5, 2021, the working face has advanced 1,565 meters and produced 3.2 million tons of raw coal.



# SANY



Sany provides green, safe and efficient mining solutions for global mineral producers.

# SANY

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