NOVA PETROLEUM
SERVICES

Serve the World with Excellent Quality,
Be the Company Customers Cannot Do Without!

PROFESSIONAL
SUPPLIER OF OILFIELD
SURFACE ENGINEERING EQUIPMENT

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ABOUT NOVA >>>

Nova Petroleum Services Wuxi Ltd. was established in 2006 and listed on the National Equities Exchange and Quotations (stock code: 837531) in 2016. It is a national high-tech enterprise integrating research and development, production, sales, and service. The company focuses on the design and manufacturing of fluid control equipment, pressure-bearing parts inspection and control equipment, and new energy equipment, as well as related product system solutions, to achieve an integrated business model of "equipment + system + service".

insists on professional development and focuses on core technology and product development. As one of the earliest localization developers and suppliers of wellhead safety control systems in China, NOVA represents the exquisite level of independent innovation in China's wellhead safety control system. Currently, NOVA has more than 50 patents and software copyrights, has possessed ISO9001, ISO14001, ISO45001, American Petroleum Institute API SPEC 6A Certification, ASME U Stamp Certification, Special Equipment Manufacturing License, and Explosion-proof Qualification Certificate, and other system or product certifications, and has won honors such as Shenzhen Specialized, Refinement, Differential, Innovation Small and Medium-sized Enterprises.

has always adhered to its original intention, actively responded to the social responsibility, practiced the national policy of carbon peak and carbon neutrality, and insisted on "Serve the world with excellent quality and be the company customers cannot do without!" NOVA is tirelessly working towards this vision!

30+
senior technical experts

19+
years of industry experience

7*24h
quick response service

50+
patents and software copyrights

COMPANY HISTORY >>>

2006

- NOVA was officially established in Shenzhen.
- Developed the first localized domestic high-pressure wellhead safety valve control system, which was applied to the Northwest Branch of Sinopec and awarded the invention patent.

2007

- Developed the first fully intelligent oil pulse testing equipment in China, which was applied to the Chinaust Laboratory Center in Hebei.

2008

- Developed the first ultra-high-pressure sulfur-resistant wellhead control system in China, which was applied to the Puguang gas field of Sinopec.

2010

- NOVA was awarded as a national high-tech enterprise.
- Aquired the American Petroleum Institute (API) certification.

2011

- Developed the first domestic zirconium tube testing machine for the nuclear industry, which was applied to the Nuclear Power Institute of China.
- The first multi-well control panel for offshore platforms was put into use in the Weizhou project of CNOOC.

2013

- Developed the first set of ultra-high-pressure wellhead safety intelligent control system in China, which was applied to the Tarim Oilfield Branch of CNPC.

2016

- NOVA was listed on the National Equities Exchange Quatations of the capital market.

2017

- WH New Energy Technology Co., Ltd. was established in Wuhan, to enter the hydrogen energy industry.
- NOVA was granted authorized supplier by ADNOC, the national oil company of the United Arab Emirates, marking the official entry of NOVA's products into international first-class brands.

2018

- Developed key components testing equipment for hydrogen fuel cell vehicles and hydrogen refueling stations.

2019

- Luotian Co., Ltd. was established and the production base was relocated from Huizhou, Guangdong to Luotian, Hubei.
- Obtained the Special Equipment Production License.
- Developed a 90 MPa hydraulic hydrogen compressor.

2020

- Developed a 1000 kg/d hydrogen refueling station.

2021

- Conducted research and development on hydrogen storage systems, hydrogen tank hydraulic pressure testing equipment, hydrogen cycling testing equipment, hydrogen valves, pressure regulator, and other hydrogen energy equipment and components.

2022

- Awarded as the Shenzhen "Specialized, Refinement, Differential, Innovation" Small and Medium-sized Enterprise.

2023

- Awarded the title of "Guangdong Famous Brand" .
- Designated as a Leading Drafting Organization of Industrial Standard "Evaluation Standards for Green Enterprises in the Hydrogen Energy Industry".
- Wellhead Safety Intelligent Remote Control System recognized as a "Guangdong Provincial Famous and High-quality High-tech Products".

2024

- Successfully deployed the self-developed SIL3-PLC-integrated Wellhead Safety Control System in ADNOC' s first intelligent Wellsite Modular Skid project.
- Developed the multi-head chemical injection skid successfully put into operation at the B9 Block Gas Processing Facility Project in Iraq.

ENTERPRISE ADVANTAGES >>>

- The one of the earliest teams in China to engage in the research and application of wellhead safety control system products.
- Nearly 20 years of solid project experience in fluid control equipment, pressure-bearing component measurement and control products.
- Our oilfield surface engineering equipment has been used in more than 20 countries.
- Over 100 project application experiences and a fully professional talent team including mechanical, hydraulic, electrical, software, and testing engineers.

Leading R&D Technology

- We have been focusing on fluid control and testing system technology research for nearly 20 years.
- Our management team has extensive industry experience and our technical R&D team is composed of senior professionals.
- We have accumulated over 50 patents and software copyrights, and have independent research and development capabilities for overall equipment and core components.
- We have also jointly established technology research centers with Tsinghua University, Wuhan University of Technology, and other research institutions, forming an authoritative and professional R&D team.

Intelligent Manufacturing

- Our company has the production capability of manufacturing from components to integrated systems, utilizing intelligent manufacturing technologies.
- Our production facilities are equipped with explosion-proof certifications, ensuring safe production practices.
- All employees are certified to perform their duties and are strictly evaluated for their professional qualifications.
- We have established a comprehensive production management system, with a reliable quality control across the entire production process and a robust supply chain management.

Deep Testing Capability

- As the supplier of testing equipment for the top-5 national automotive laboratory in China.
- We have authoritative and standardized testing capabilities.
- We have independently developed our testing equipment and have maintained a stably growth in testing business.

Attractive Market Positioning:

- Specialized and refinement market development, with a leading market share in the domestic market for wellhead safety control systems.
- Businesses are distributed in more than 20 provinces and cities in China, while also being exported to major oil and gas producing countries around the world.

  As a qualified supplier for CNPC, Sinopec, CNOOC, ADNOC, and others, long-term friendly relationships are conducive to expanding business and promoting cooperation.

COMPANY LOCATIONS

BUSINESS PARTNERS >>>

中国石油

Sinopec

CNOOC 中国海油

Shell

Kuwait Oil Company

Bapco Upstream

TotalEnergies

Husky

NMDC DREDGING & MARINE

Petrofac

PETROSERVE INTERNATIONAL

HALLIBURTON

ADNOC

OIL & GAS DEVELOPMENT COMPANY LIMITED

PPL

MOL MEMBER OF MOL GROUP

CAMC

HEISCO

MINISTRY OF OIL

eni

TechnipFMC

Kuwait Energy

MMEC MANNESMANN develop. design. deliver.

SOLUTIONS

Automotive Testing Equipment

PVT (pressure-volume-temperature) test machine
Permeability test machine
Blast test bench
Online test machine
Volume expansion test machine

Military Testing Equipment

Zirconium tube internal pressure creep fatigue test machine
Zirconium tube high-temperature blast test machine
High-speed rotation test machine for aerospace seals
High and low temperature cycling test machine for aerospace hydraulic components

Oil & Gas Equipment

Wellhead safety control system
Chemical injection skid
Oilfield laboratory equipment

Hydrogen Energy Equipment

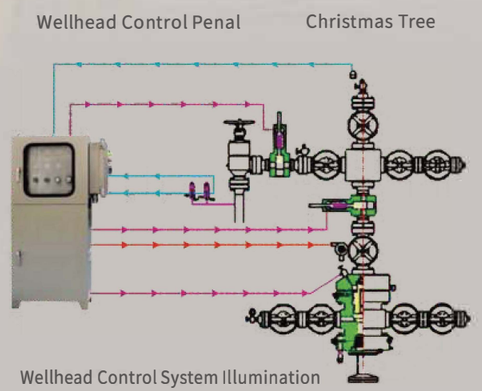
Hydrogenation station equipment
Hydrogen storage system
Hydrogen power generation system
Third-party testing center for hydrogen energy equipment and components

OIL & GAS EQUIPMENT SOLUTION >>>

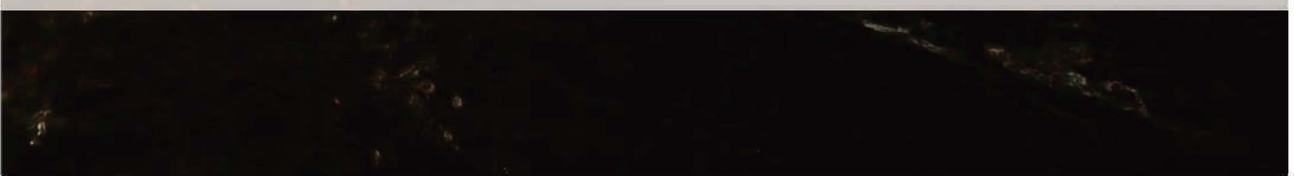
We have been focusing on wellhead safety control systems and ground skid-mounted equipment for oil and gas field engineering for nearly 20 years. We have the capability of systematic production, service and collaborative support, as well as industry-specific technical expertise and core competitiveness. As one of the earliest China domestic suppliers specialized in oilfield surface engineering equipment, we can offer customers comprehensive and satisfactory services, apply system solutions in projects, and efficiently serve our clients, striving to be the pioneer and driving force in the industry.

WELLHEAD SAFETY CONTROL SYSTEM >>>

NOVA has extensive project experience in the design, manufacturing, and commisionning of the wellhead safety control system (WHCP), which can be single-well controlling, multi-well controlling, or solar powered. The applicable scenarios can be onshore, offshore, desert areas, or artificial islands. As the leader and innovator in WHCP, NOVA strickly follows the standards of system design, cutomers' speficiations, and fabrication to assure the reliability, maintainability, and feasibility. The control of WHCP varies from pneumatic/hydraulic to PLC-based.



Wellhead Control System Illumination



PLC Integrated Wellhead Application

For wellheads that require high reliability and programmable logic control, NOVA has developed the PLC-based wellhead control system. The system is designed with advanced fault-tolerant, fail-safe programmable logic controllers, internationally certified safety I/O modules, simplex/ redundant configurations, and communication modules for intelligent control of the wellhead.

- **Power sources:**manual hydraulic pumps and electric hydraulic pumps.
- **Control objects:** surface safety valves and subsurface safety valves.
- **Applicable working conditions:** wellheads that require high reliability and programmable logic control.

Function and Features

1. The hydraulic pump is driven by a 380V AC motor.
2. Suitable for single-well and multi-well control.
3. Controlled by solenoid valves, can be operated through panel buttons or touch screen.
4. Explosion-proof level can reach Ex d IIB T4 and above, suitable for Zone 1, Gas Group IIB, and Temperature Class T4 and above.
5. Protection level can reach Ip66.
6. Optional redundant PLC control module.
7. System safety level can reach SIL3.

Desert and Remote Wellhead Applications

For areas where power supply is unavailable in desert and remote regions, NOVA has developed a solar-powered wellhead safety control system that uses solar energy as a power source. For natural gas reservoirs, a gas wellhead safety control system can also be designed to use natural gas as a power source in order to reduce costs.
Considering the difficulty of inspecting wells in person in desert and remote areas, these types of wells are remotely controlled and monitored by RTU.

- **Power source:** solar energy, electric hydraulic pump.
- **Control objects:** subsurface safety valves, surface safety valves, etc.
- **Applicable working conditions**:
  unmanned areas in remote areas such as deserts,
  Gobi, mountains, etc.

Function and Features

1. The hydraulic pump is driven by a 24V DC motor.
2. Equipped with a solar power system (nickel-chromium batteries or hydrogen fuel cells, etc. can also be selected according to environmental needs).
3. Equipped with wireless remote signal transmission equipment, based on 4G/5G network environment.
4. Can be remotely monitored by video, with access control and fault alarm, without the need for on-site personnel.
5. Protection level can reach Ip66.
6. The system design meets with a wide range of temperature tolerance and can withstand the impacts of extreme cold, high temperatures, and extremely large temperature differences.
7. Equipped with local shutdown, remote shutdown, ESD manual station shutdown, fusible plug shutdown, and high and low pressure pilot valve shutdown functionalities.

Application on Offshore Oil and Gas Wellhead on Ocean Platform

Based on the characteristic of centralized control of multiple oil/gas wells on the ocean, NOVA has developed a multi-well wellhead safety control system, which contains multiple wellhead control modules. Each control module controls one well independently without interference, which facilitates maintenance and replacement.
The control system can be designed according to customer requirements as pneumatic-hydraulic, electric-pneumatic, electric-hydraulic systems with remote control interfaces.

- **Power source:** manual hydraulic pump, electric hydraulic pump, pneumatic hydraulic pump.
- **Control objects:** surface safety valve and subsurface safety valve, etc.
- **Applicable working conditions:**
  oil and gas wellheads on offshore platforms.

Function and Features

1. The system consists of a shared HPU module and simplex wellhead control modules. The overall system can control up to 30+ wells.
2. The system is suitable for use in offshore environments, and all components are made of materials superior to 316 SS.
3. The explosion-proof rating can reach Ex d IIB T4 and above, suitable for Zone 1, Gas Group IIB, and Temperature Class T4 and above.
4. The protection level can reach Ip66.
5. It has functions such as local shutdown, remote shutdown, ESD manual station shutdown, fusible plug shutdown, and high and low pressure pilot valve shutdown.

Application in HPHT and hydrogen sulfide-enriched wells

Designed for oil/natural gas wells with special working conditions such as high temperature, high pressure, and hydrogen sulfide-enriched.

The high-pressure and hydrogen sulfide-enriched wellhead safety control system mainly adopts pneumatic-hydraulic or electric-hydraulic type, and the communication and safety control system is integrated with RTU and SCADA, which can easily achieve local and remote control. This type of wellhead control panel is suitable for service environments containing H_2S and CO. The valves, fittings, and tubings are selected according to the characteristics of media.

- **Power source:** manual hydraulic pump, electric hydraulic pump, pneumatic hydraulic pump.
- **Control objects:** surface safety valve and subsurface safety valve, etc.
- **Applicable working conditions:** oil/natural gas wells with special working conditions such as high temperature, high pressure, and sour gas.

Function and Features

1. The system can control pressure up to 35,000 psi and above.
2. The RTU control system adopts redundant CPUs, and all channels are equipped with surge protectors.
3. Explosion-proof level can reach Ex d IIB T4 and above, suitable for Zone 1, Gas Group IIB, and Temperature Class T4 and above.
4. On the site, data of the instruments and equipment (pressure, temperature, flow rate, throttle valve opening angle, etc.) are connected to the system, and various equipment in the field (heating rods, separators, and flare systems, etc.) can be controlled as required.
5. The cabinet is equipped with an explosion-proof color touch screen and provides perfect operating control software. Various parameters can be easily set to achieve automatic control.
6. Safety features include local shutdown, remote shutdown, ESD station shutdown, automatic emergency shutdown with fusible plug for fire protection, 2-out-of-3 logic pressure abnormal alarm, and process pipeline pressure drop alarm.

SOLAR POWER SYSTEM

Our solar power system harnesses high-efficiency photovoltaic modules to convert solar energy into electricity, providing a clean, sustainable, and cost-effective energy solution. Designed for optimal performance in remote, sun-rich environments such as deserts and plateaus, our systems maximize power generation efficiency while minimizing maintenance costs.

At NOVA, we specialize in tailored solar power solutions, customizing each system to meet your specific load requirements. Our goal is to deliver the most cost-effective and reliable energy solutions without compromising performance. With extensive design expertise and advanced manufacturing processes, we have successfully deployed solar power systems in Kuwait, Pakistan, and other regions worldwide. Trust NOVA to provide cutting-edge solar technology that meets your energy needs with efficiency and durability.

Solar Panels

As the core power generation unit, NOVA solar panel converts sunlight directly into DC electricity through the photovoltaic effect. Made from high-purity silicon or advanced thin-film technology, it offers exceptional efficiency and strong weather resistance, ensuring reliable performance even in harsh environments.

Function and features

1. Convert solar radiation energy into direct current to provide basic power for the system.
2. Adopt monocrystalline silicon/polycrystalline silicon technology, with a photoelectric conversion efficiency of 18%-22%, and can still generate electricity under weak light conditions.
3. IP68 protection level, anti-ultraviolet, high temperature and corrosion resistance, adaptable to extreme environments of -40°C to 85°C.
4. Strengthened design, so that the components pass 5400Pa front snow load and 2400Pa wind load certification.
5. The power attenuation rate is less than 20% within 25 years, ensuring long-term stable power generation.

MPPT Controller

Acting as the "brain" of the solar power system, N Maximum Power Point Tracking (MPPT) controller dynamically adjusts to maximize power conversion efficiency. By continuously tracking the optimal output point of the solar panels, it enhances overall system perfоrmance and ensures maximum energy yield.

Function and features

1. Adjust voltage and current in real time to ensure that the solar panels always output electricity at the highest efficiency.
2. Intelligently match the battery charging curve to prevent overcharging/over-discharging and extend battery life.
3. Adapt to various battery types such as lead-acid, lithium battery, nickel-cadmium, etc.
4. MPPT efficiency > 99%, and the power generation is 20%-30% higher than the traditional PWM controller.
5. It has multiple protection mechanisms such as overload, short circuit, reverse connection, overtemperature, etc. to ensure system safety.
6. Supports multiple system voltages such as 12V/24V/48V, and is compatible with high-power component arrays.
7. Supports MODBUS communication protocol, and can communicate through RJ45 network port, RS485 and RS23 serial port.

Battery: NOVA primarily utilizes tubular gel batteries and nickel-cadmium batteries for energy storage, both offering low maintenance, high safety, and an ultra-long lifespan. Designed fоr deep discharge applications (DOD >80%), these batteries deliver exceptional durability, with cycle lifetimes exceeding 1,200 cycles, ensuring reliable and efficient energy storage for solar power systems.

Tubular Gel Batteries

NOVA tubular gel battery is an advanced lead-acid battery solution, featuring a tubular positive plate design and gel electrolyte technology. Engineered for deep-cycle charging and discharging, it delivers superior durability and efficiency, ma king it an ideal choice for reliable solar energy storage.

Function and features

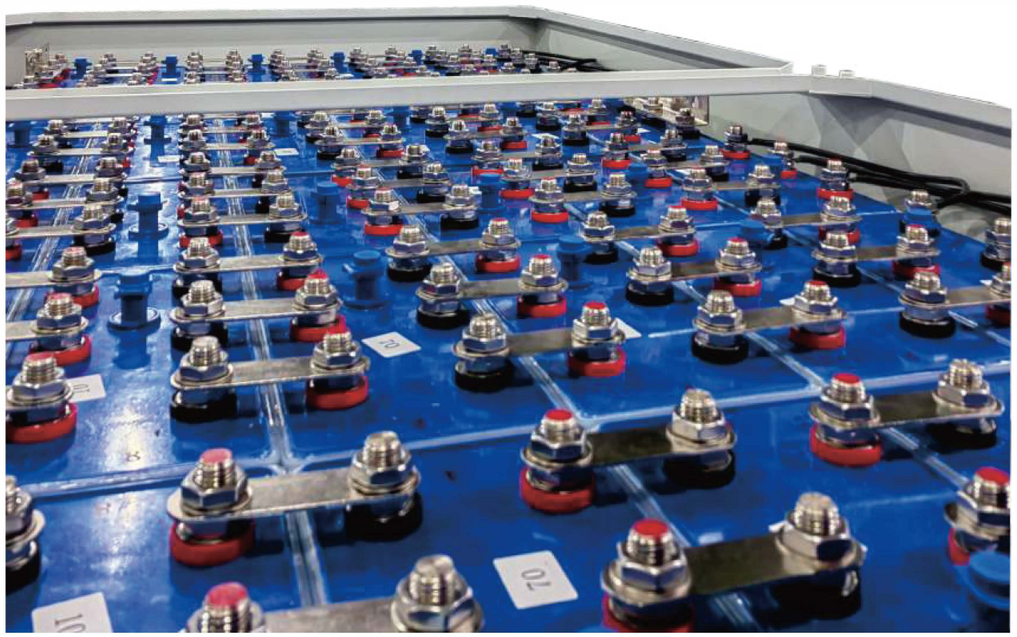
1. Supports frequent charging and discharging, suitable for daily charging and discharging needs of solar energy systems.
2. Provides continuous and stable DC power supply to ensure stable operation of load equipment.
3. Gel electrolyte solidification technology, no risk of liquid leakage, no need for regular water replenishment .
4. Wide operating temperature range (-20°C to 50°C), and the capacity retention rate in high temperature environment is 20% higher than that of ordinary batteries.
5. Gel electrolyte is resistant to thermal runaway and is suitable for tropical areas or closed environments with poor ventilation.
6. No free acid liquid, no hydrogen precipitation, can be safely used indoors or in sensitive places.

Nickel-cadmium battery

Built with nickel oxide hydroxide and metallic cadmium electrodes, NOVA nickel-cadmium battery is designed to withstand extreme temperatures and demanding conditions. With excellent resistance to overcharging and long service life, it is perfect for off-grid solar systems, emergency power backup, and applications in high-temperature or cold environments.

Function and features

1. Support high-rate discharge to meet the starting requirements of motors, water pumps and other equipment.
2. Can work stably in an environment of -40°C to 60°C, and adapt to harsh conditions such as extreme cold and desert.
3. Tolerant to non-balanced charge and discharge, simple maintenance, and no need for complex BMS system.
4. No risk of thermal runaway, and better stability than lithium-ion batteries.
5. The depth of discharge can be reach 100%, and the design life is up to 20 years.



CHEMICAL INJECTION SKID

Chemical injection skid is designated to continuously or intermittently inject chemical agents with accuracy of doses under the backpressure.

The usage for different chemicals of the injection skid include: Reverse demulsifier, corrosion inhibitor, scale inhibitor, demulsifier, alkalinity, anti-foam, etc.

Conventional chemical injection skid

This is used for conventional chemical injection in factories or oil fields, including chemical storage containers, pumps, valves and instruments, related tunbings, and electrical controls. All of these components are installed on a single enclosed skid. Conventional injection skids are widely used in onshore applications.

Function and features

1. The skid-mounted structure reduces the technical requirements for on-site installation.
2. Centralized control would grant the operation more safeness and convinence.
3. Equipped with high-precision flow meters, the system can remotely adjust the flow rate without affecting the output pressure.
4. Power soure: pneumatic or electric pump.
5. The material of chemical agent storage tanks, valves, and tubings can be selected according to the characteristics of different chemical agents.

Multi-point chemical injection skid

The purpose of the multi-point chemical injection skid is to use a single metering pump to inject different chemical agents at different injection points, flow rates, and pressures.

This type of skid is more suitable for situations where there are a large number of injection points and limited space. This product replaces multiple chemical injection devices with a single skid, reducing operating and maintenance costs and improving space efficiency.

Function and Features

1. A single metering pump can be equipped with multiple pump heads, allowing for injection of chemical agents at different pressure and flow rates for different injection points.
2. The skid structure reduces technical requirements for on-site installation.
3. Centralized control would grant the operation more safeness and convinence.
4. Equipped with a high-precision flow meter, the system can remotely adjust the flow rate without affecting the output pressure.
5. Power source: pneumatic or electric pump.
6. The chemical agent storage tanks, valves, and tubing materials can be selected according to the characteristics of different chemical agents.
7. The highly compact design is suitable for offshore and FPSO applications.

PRESSURE TESTING EQUIPMENT

NOVA has led the design, construction, and overall solutions for multiple national-level high-temperature and high-pressure laboratories, representing the technological high ground for domestic high-temperature and high-pressure laboratory construction.
According to different customer needs, NOVA can provide pressure sources with different pressure specifications and automation levels for customers to customize and provide the required pressure testing systems.

Gas Tightness Test bench

The gas tightness test bench uses high-pressure nitrogen to perform sealing tests on specimens, in order to meet the requirements of manufacturers and testing agencies for sealing tests on valves, wellhead Christmas trees, blowout preventers, and manifold.

For the gas tightness test of valves and wellhead Christmas trees, a multi-stage pneumatic booster pump is used for pressurization. The test meets the requirements of standard API Spec 6A and the specifications of PSL1-PSL4.

For the gas tightness test of blowout preventers and manifold, a hydraulic-driven booster pump is used, which has high efficiency and large displacement. The test meets the requirements of standard API 16A.

Function and features

1. The maximum test pressure can reach 300 Mpa.
2. The core components of the equipment, such as gas booster pump, high-pressure valves, and instruments, are all high-quality international brands, ensuring safety and reliability.
3. The equipment cabinet is a fully enclosed box, with control buttons concentrated on the panel for safe operation.
4. Equipped with precision pressure gauges and high-precision sensors, and operated through a touch screen on the site.
5. Optional computer control console for fully automatic operation, can display test curves and print reports.

Water Pressure Test Machine

The sealing performance of the test piece is tested with high-pressure purified water to meet the requirements of manufacturers and testing organizations for water pressure testing of valves, wellhead Christmas trees, BOP, and manifold.

For the water pressure testing of valves and wellhead Christmas trees, a multi-stage pneumatic booster pump is used for pressurization. It complies with the American API 6A testing standard and the specifications of PSL1-PSL4.

For the water pressure testing of BOP and manifold, a hyraudlic-driven booster pump is used, which has high efficiency and large displacement. The test meets the requirements of standard API 16A.

Function and Features

1. Maximum test pressure can reach 400 MPa, and can be configured for multi-channel and multi-stage testing according to requirements.
2. Maximum system output flow: 8 L/min for medium pressure, and 4 L/min for high pressure.
3. Equipped with high-precision pressure gauges and sensors, using touch screen for easy on-site operation.
4. Optional computer control console for fully automatic operation, can display test curves and print reports.
5. The tubing layout is highly optimized. All the high-pressure fittings are using Autoclave quick connect fittings, which do not require welding and are easy for connection and maintanence.

Mobile Pressure Test System

According to the different needs of customers, we have selections of pressure sources with different pressure levels and automation levels, which are widely used in various mobile pressure testing vehicles and containerized portable pressure testing equipment.

- **Application objects/scenarios:** Various mobile pressure testing vehicles and containerized pressure testing equipment.

Function and Features

1. The maximum test pressure can reach 210 Mpa.
2. The capacity of the media tank can reach 600 L, and the test flow rate can reach 500 L/h.
3. It has remote control of pressurization, pressure regulation, pressure relief, overpressure protection, etc., as well as sound and light alarm system.
4. The control system of the pressure testing equipment is designed with a remote ESD fucntionality to stop the pump.
5. The pressure testing process and data are automatically generated and managed, and the on-site data is encrypted and cannot be modified by non-managers.
6. Equipped with a video monitoring probe. It can achieve 180° rotation and vertical adjustment, and has shockproof protection.
7. Optional four-wheel drive chassis for versatility of on-road and off-road services.

PR2 TEST SYSTEM

The PR2 system consists of a high and low temperature environmental chamber, valve driving device (torque testing tool), water/gas pressurizing equipment, measuring and control system, and monitoring system. It can automatically conduct test for the pressure, temperature, and torque combined cycle tests specified by the PR2 standard. It meets the requirements of standards such as API 6A, ISO 10423, GB 10592.

- **Application objects/scenarios:**The strength and sealing test of ram BOP, annular BOP, valve, hanger, Christmas tree and other wellhead products, the dynamic test of valve opening and closing at maximum/minimum temperatures, valve pressure/temperature cycling tests, torque tests, etc.

Function and Features

1. Maximum pressure can reach 210 Mpa.
2. The temperature of the environmental chamber can reach -40 to 200°C.
3. A torque tester can be customized according to the valve and automatically test the valve opening and closing.
4. The PR2 testing system achieves full automatic control and automatically completes combined tests and cyclic tests of temperature, pressure, and load according to the set parameters.
5. The system has multiple overpressure protection functions, and both software and hardware can achieve pressure overpressure protection.

Wellhead Equipment and Blowout Preventer Test System

The testing system for wellhead equipment and blowout preventer consists of the following components:

The blowout preventer life testing machine is used in conjunction with other systems to complete fatigue test, constant well pressure test, constant hydraulic closing test, pressure-bearing and drilling life test, and hanging test. The locking device test, hydraulic control oil circuit cylinder strength test, core disassembly and assembly test, and shear gate test can also be performed on this device.

The blowout preventer pressure testing device opens or closes the device by switching different output circuits and has multiple circuits.

The non-metallic seal design temperature verification device performs high and low pressure testing on each temperature level of the blowout preventer.

The data measurement and control and video monitoring system monitor and control the entire testing process and achieve high automation control.

- **Application objects/scenarios:** This system is used for testing the life, pressure, high and low temperature, sealing, and other properties of ordinary blowout preventers and rotating blowout preventers.

Function and Features

1. The system has a loading capacity of 300 tons and the up/down stroke of 1.5 m.
2. The maximum working pressure is 140 MPa, with a maximum diameter of 680 mm. The maximum allowable combination state is as follows (diameter(mm)-pressure(MPa)): 68-21, 54-70, 48-105, 28-140.
3. The temperature and pressure of all tests can be automatically meassured through the data collection system, and are displayed by instruments.
4. The environmental chamber is designed with a safety blowout ventilation, the pit is designed with a pressure wave release ventilation, and the environmental chamber is reinforced to prevent secondary disasters. Safety is reassured from the design phase.
5. The system is highly automated, reliable, and easy to operate, as well as convenient and safe to install the drilling tools and blowout preventers.

High-Temperature High-PressureTesting System for Downhole Tools

The high-temperature high-pressure testing system for downhole tools mainly consists of a high-pressure/ultra-high-pressure testing well for downhole tools, an intelligent high-pressure/ultra-high-pressure oil, gas, and water boosting system, a force loading testing device, a circulation heating and insulation device, and a remote central measurement and control system.

- **Application objects/scenarios:**It is mainly used to simulate the high-temperature and high-pressure environment of downhole tools such as packers and bridge plugs in actual working conditions. According to API 11D1 standard, V0 level verification tests are carried out, including gas tests, axial load tests, temperature cycle tests, and zero gas bubble acceptance standards for performance testing of packers and bridge plugs. It includes envelope curve verification tests for downhole tools, as well as pressure and temperature resistance tests for other instruments and tools that require high-temperature and high-pressure environment testing. At the same time, it provides testing means for the development of new downhole tools.

Function and Features

1. The system can achieve a testing pressure of up to 300 Mpa.
2. The tool heating temperature can reach up to 350℃.
3. The load testing can have a loading capacity of up to 350 tons.
4. It can perform testing for tools ranging from 4-1/2" to 13-3/8".
5. NOVA has more than 20 patented technologies in high-pressure equipment, testing wellbores, control software, and other aspects.
6. NOVA has developed advanced technologies in mechanical structure, pressure and temperature control, and software structure.
7. NOVA has independently constructed and participated in the construction of more than 10 testing laboratories, equipped with complete testing equipment and advanced control methods.
8. It is the first in China to create a 3D creep testing device for downhole tools, simulating the stress state at different angles and positions during tool descent and operation.

OTHER SPECIALIZED EQUIPMENT

NOVA has extended a series of high-value products in projects such as choke manifold and wellhead control systems.

Surface Safety Valve

The Surface Safety Valve, together with the Wellhead Control Panel, forms the Wellhead Safety Control System. Our Surface Safety Valve is a type of linear motion valve driven and controlled by pneumatic or hydraulic, and relied on spring reset. It is applied in oil and natural gas well fields to provide safety protection in critical situations such as oil and gas leakage or fire. It can directly and quickly shut off the wellhead.

Function and Features

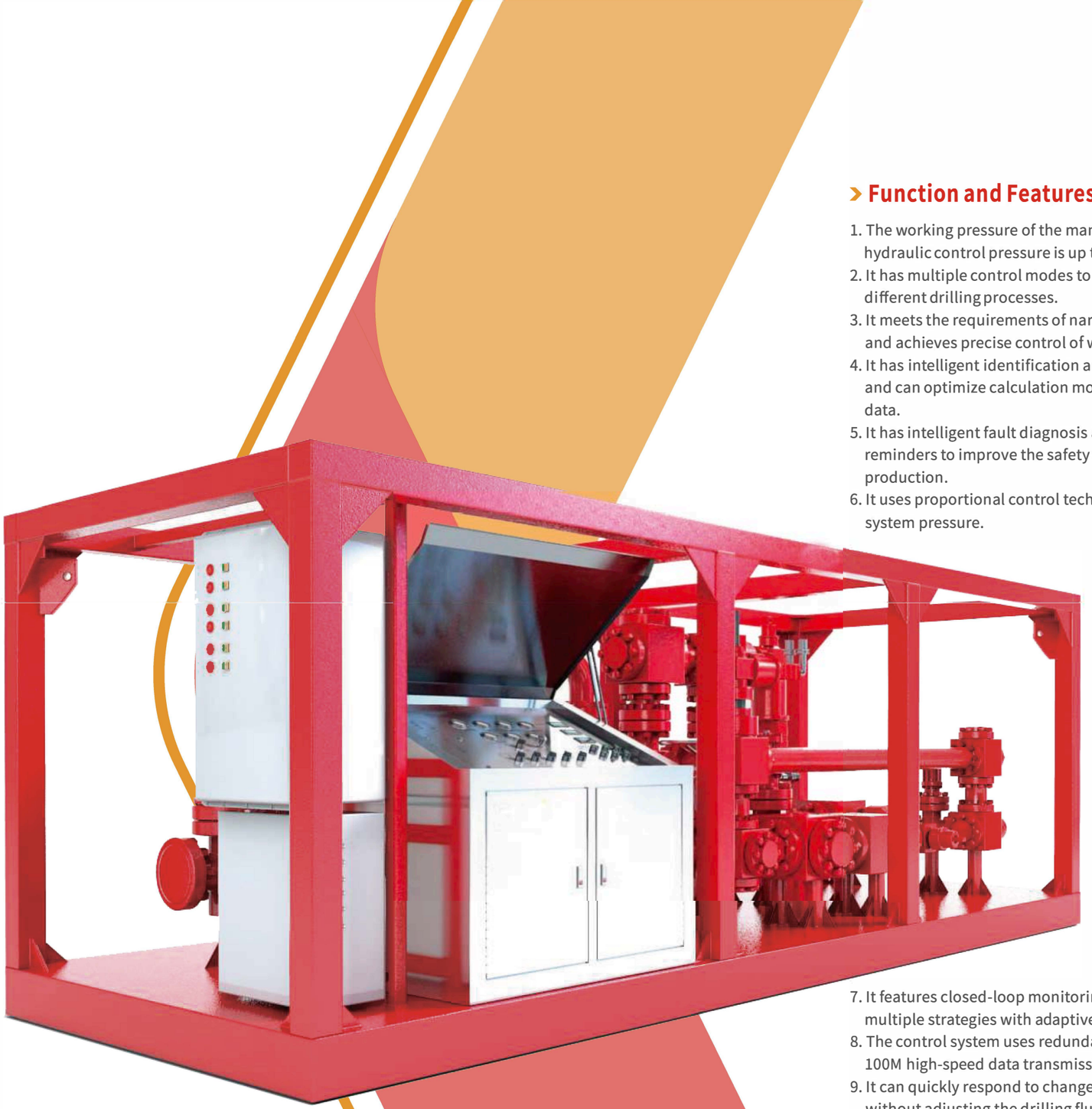
1. The product has a maximum pressure of up to 140 MPa, with alloy type HH, temperature grade P-U (-29°C to 121°C), specification grade PSL4, and performance grade PR2.
2. The active structure design: The high-degree-of-freedom connection is used between the piston rod and the piston, and between the piston and the valve stem, which efficiently transfers the thrust. It prolongs the life of the sealing components and makes the actuator work more smoothly.
3. Serial sealing structure: The piston seal and piston rod seal both use serial linkage sealing, which meets the zero leakage requirements at various pressure levels and temperature ranges. The excellent sealing structure and materials make the overall sealing resistance of the actuator extremely small.
4. High-performance spring: The spring is made of alloy steel by hot rolling. A series of heat treatments stabilizes its stiffness, improves its fatigue strength, and ensures long-term compression without deformation. The surface is treated with electrophoretic coating, which has good anti-corrosion performance.
5. Fine processing and plating technology: The dynamic sealing surface of the safety valve is treated with chemical nickel plating and precision grinding, giving it excellent wear resistance and anti-corrosion performance, enabling it to work in harsh environments for a long time.

Managed Pressure Drilling System

The MPD system mainly consists of a choke manifold control system, backpressure compensation system, remote monitoring system, and software system. The system integrates pressure monitoring and micro-flow monitoring functions. Through self-developed automatic control software, it can accurately control the downhole pressure, achieving managed pressure drilling.

The MPD system treats the wellbore as a closed pressure system and sets the control objective for the annular pressure at the bottom of the well according to the upper and lower limits of the safe pressure interval. By using drilling fluid density smaller than the formation pore pressure and applying automatic throttling backpressure control technology, the system manages the pressure throughout the wellbore in a closed loop, counteracting the pressure fluctuations generated by drilling, stopping pumping, adding or removing drill pipes, and other drilling operations, thereby effectively addressing complex drilling problems such as density window, pressure-sensitive formation leak-off, same-layer formation drilling, and borehole collapse.

- **Application objects/scenarios:** oil and gas drilling operations.



Function and Features

1. The working pressure of the manifold is up to 105 MPa, and the hydraulic control pressure is up to 70 Mpa.
2. It has multiple control modes to meet the requirements of different drilling processes.
3. It meets the requirements of narrow density window drilling and achieves precise control of well pressure.
4. It has intelligent identification and automatic control functions and can optimize calculation models based on on-site logging data.
5. It has intelligent fault diagnosis and manual intervention reminders to improve the safety and reliability of drilling production.
6. It uses proportional control technology to precisely control system pressure.
7. It features closed-loop monitoring of annular pressure and multiple strategies with adaptive characteristics.
8. The control system uses redundant industrial Ethernet with a 100M high-speed data transmission rate.
9. It can quickly respond to changes in formation pressure without adjusting the drilling fluid density, protect the reservoir, and reduce damage.
10. It reduces drilling pressure, improves drilling speed, and reduces the number of casing layers, thereby reducing drilling costs.

Choke Manifold Control System

The control system that manages the manifold valves at the wellhead uses pneumatic-hydraulic/electro-hydraulic logic. It can meet the working requirements of various sizes of manifolds, maintain stable wellhead pressure, ensure the safety of wellhead production, protect wellhead equipment and pipelines, protect oil and gas resources and the environment, prevent pollution, and is easy to operate with stable performance, saving labor and reducing the labor intensity of outdoor operations.

It can remotely control the opening and closing of the hydraulic choke valve, and display the standpipe pressure, casing pressure, and valve position of the hydraulic choke valve on the control box to maintain the bottom hole pressure. It is necessary equipment for successfully controlling well kicks and blowouts, and implementing oil and gas well pressure control technology.

- **Application object/scenatios:** control of various valves on the choke manifold.

Function and Features

1. The working pressure of the manifold is 105 MPa, and the hydraulic control pressure is 70 Mpa.
2. Accurately control the opening of the choke valve and the on/off status of the hydraulic plate gate valve. The hydraulic control circuits of each choke valve and hydraulic plate gate valve are completely independently controlled.
3. Real-time monitoring of the pressure, choke valve opening, and gate valve on/off status of the control loop.
4. The control cabinet is equipped with abnormal pressure alarm function for the hydraulic circuit of the plate gate and choke valve, with ESD emergency shutdown and PSHL shutdown.
5. The hydraulic control circuit can automatically supplement pressure and automatically discharge excess pressure to maintain the normal opening of the hydraulic valve.
6. The all-stainless-steel design is suitable for harsh environments and climates, and uses imported components with stable system performance.
7. The equipment reserves a melting fuse interface with fireproof and shutdown functions.
   The pneumatic-hydraulic control mode is energy-saving and environmentally friendly.

Oil Casing Gas-tight JointDetection Device

This refers to a device used to test the gas-tightness of the threaded connection of an oil casing. After the connection is made, a high-pressure booster is used to pressurize a mixture of high-purity helium and hydrogen to the testing pressure. The upper and lower parts of the thread of the isolation tool form a closed space inside the oil casing, and the gas-tightness of the oil casing thread is tested using the characteristics of the small molecular weight and easy leakage of helium.

- **Application object/scenatios:**gas-tight joint detection of oil casings.

Function and Features

1. Test specifications: 2-7/8" to 13-3/8"
2. Pressure rating: 70/105/140 MPa
3. Leak detection accuracy: 1×10^-7 mbar*l/s
4. Response time: less than 7 s
5. Explosion-proof rating: Ex d IIB T4

In the hydrogen energy industry, we leverage our own advantages to focus on developing series of high-pressure hydrogen energy equipment, delve deep into cutting-edge technology research and

Hydrogen Refueling Station

The hydrogen refueling station includes the design, manufacturing, and construction of equipment such as hydrogen storage tanks, hydrogen compressors, hydrogen dispensers, cooler system, and station control systems.

Function and Features

1. Compatible with both 35 MPa and 70 MPa hydrogen refueling.
2. Strong maneuverability, reliable performance, and convenient to use, providing portable, fast, and timely hydrogen refueling services for hydrogen-powered equipment.
3. Installed in a skid-mounted container, it can be mounted on a vehicle or fixed in a designated location for service.

Mobile Hydrogen Refueling Station

The skid-mounted portable mobile hydrogen refueling station integrates hydrogen unloading system, pressurization system, dispenser, connecting tubings, control system, and safety facilities. It is a highly integrated explosion-proof hydrogen refueling device.

This portable station is used joint with the portable hydrogen storage containers to conduct hydrogen fueling service for easy installation, temporary usage, or even remoted regions.

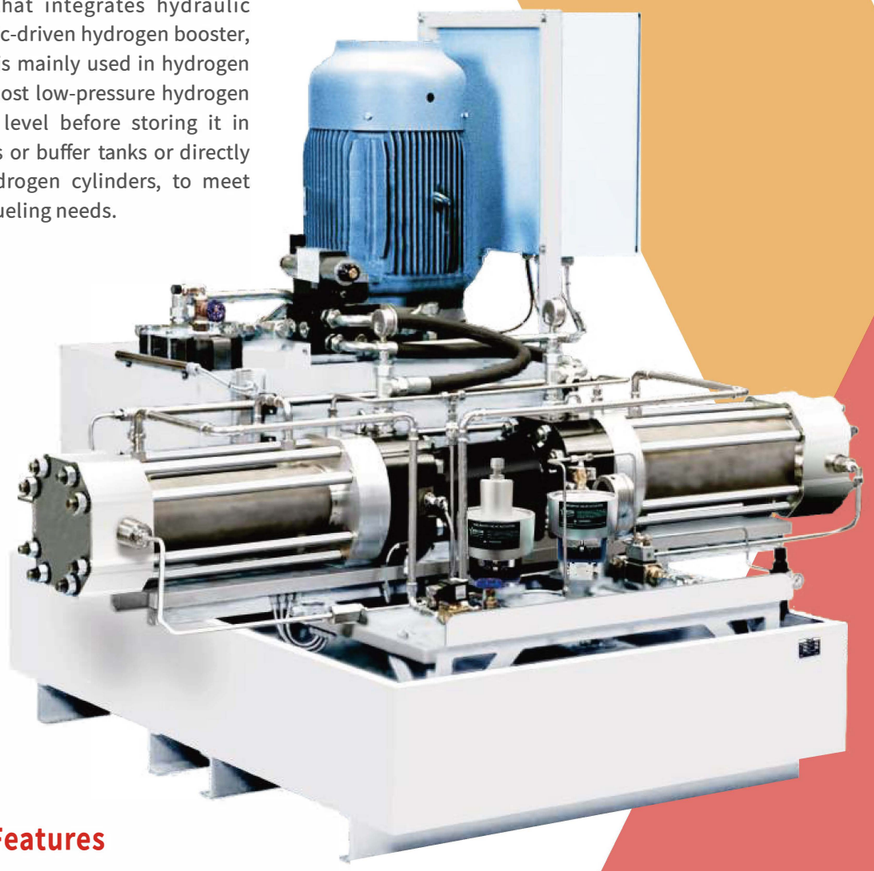
- **Application object/scenatios:**
  Capable of Hydrogen vihecle refuelling under 35 or 70 MPa. Daily hydrogen filling capacity up to 1000 kg.

Function and Features

1. Compatible with both 35 MPa and 70 MPa hydrogen refueling.
2. Strong maneuverability, reliable performance, and convenient to use, providing portable, fast, and timely hydrogen refueling services for hydrogen-powered equipment.
3. Installed in a skid-mounted container, it can be mounted on a vehicle or fixed in a designated location for service.

Hydrogen Compressor

It is a highly integrated and complete hydrogen compressor system that integrates hydraulic poewr station, hydraulic-driven hydrogen booster, and control system. It is mainly used in hydrogen refueling stations to boost low-pressure hydrogen to a certain pressure level before storing it in hydrogen storage tanks or buffer tanks or directly filling into vehicle hydrogen cylinders, to meet customer hydrogen refueling needs.



Function and Features

1. High safety explosion-proof level, maximum pressure up to 90 MPa, strong filling capacity up to 1000 kg/d.
2. Highly integrated to maximize space savings, special design process and machining with long sealing life.
3. Simple control, low maintenance rate, using hydraulic drive for hydrogen booster.
4. High volumetric efficiency, structural design conducive to heat conduction to improve volumetric efficiency.
5. Can be started frequently, suitable for heavy-duty continuous operation, high degree of automation, and real-time monitoring and automatic adjustment of output flow rate.

Sequence Control Cabinet

The sequence control cabinet connects the unloading column, hydrogen storage cylinder group, hydrogen compressor, and hydrogen filling machine to realize the control of the hydrogen loop between various process equipment in the hydrogen refueling station, control the flow direction and sequence of hydrogen, and achieve rapid hydrogen refueling.

Function and Features

1. Easy to set up, with pneumatic valve sequence control.
2. Automatic filling in stages: the system automatically selects high, medium, or low pressure gas based on the pressure of the hydrogen storage tank.
3. Supports direct filling from the compressor and from a long tube trailer.
4. Automatically replenishes the hydrogen storage tank when its pressure falls below a certain value.

Hydrogen Refueling Station Control System

The hydrogen refueling station control system consists of a refueling station payment system and an operation monitoring system, which realizes the query statistics and report output of refueling station transaction data and the safe operation monitoring of refueling station equipment.

Function and Features

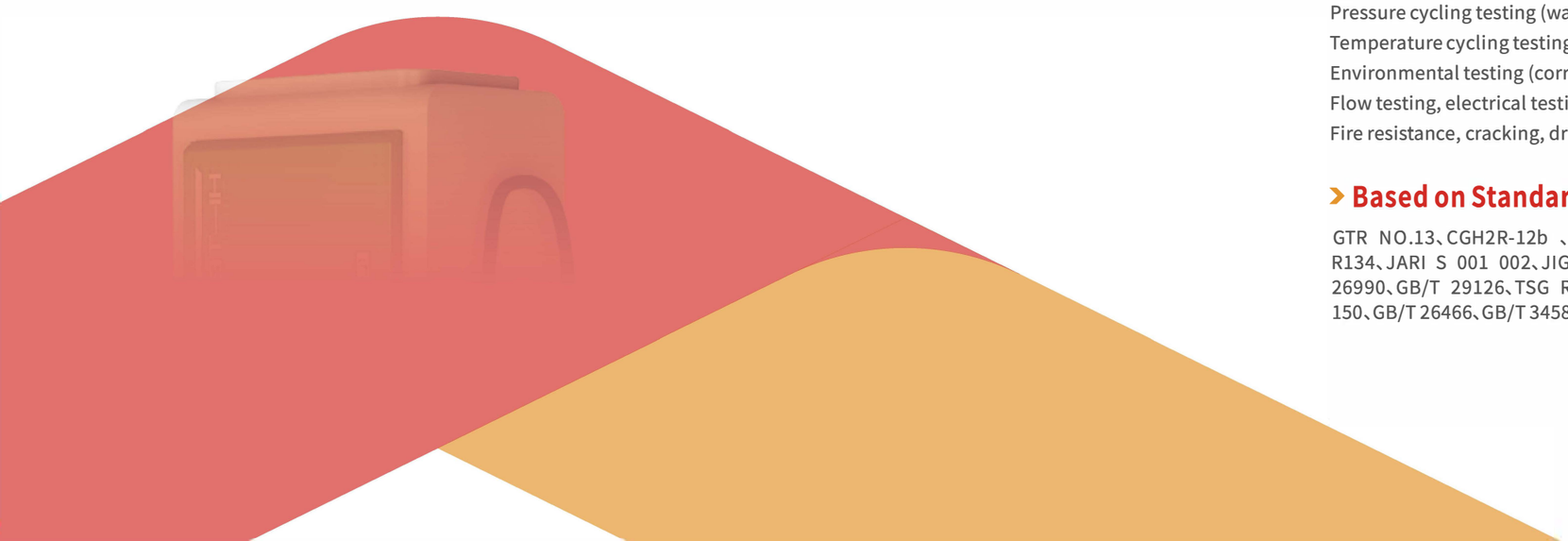
1. Uses 4-CPU redundancy fault-tolerant technology, capable of error correction and continuous uninterrupted control in the event of any failure.
2. Comprehensive functionality and powerful system configuration, able to communicate with field devices and perform remote shutdown operations.
3. Provides UPS power supply to meet the 24-hour uninterrupted power supply requirements of the DCS controller.
4. Collected data is self-diagnosed for faults and can issue level I, II, and III audio-visual alarm signals.
5. The database automatically records all alarm signals and event processing results.
6. Has data query, statistics, and output functions, and user and permission management ensures system confidentiality and safe use.

Hydrogen Dispenser

It is a specialized equipment used in hydrogen fueling stations to provide filling service to the hydrogen storage tank of hydrogen fuel cell vehicles, with metering and payment functions.

Function and Features

1.More safety: the machine has passed the explosion-proof certification.
2.Automation: the filling process is automatically controlled, including topping off and preset quantity filling.
3.Multiple detection alarms: hydrogen leakage alarm, hydrogen over-temperature alarm, over-pressure alarm, and electrostatic alarm.
4.Multi-layer safety protection: limit pressure protection, break protection, emergency shutdown.
5.Data acquisition protection: data storage protection when power is off.
6.Multiple password protection: remote monitoring and report data analysis with the central control system.



Hydrogen Equipment and Components Testing Solutions

NOVA can provide testing equipment for key hydrogen energy system equipment and components, including hydrogen compressors, hydrogen storage tanks, hydrogen tank combination valves, TPRDs, check valves, shut-off valves, fueling nozzles, fueling ports, connection devices, etc. We can also provide testing equipment for new energy vehicle components and provide overall laboratory planning solutions.

Testing Services include

Pressure and burst testing (water, oil; up to 400 Mpa)
Hydrostatic pressure testing (external testing method; up to 150 Mpa)
Leakage testing (nitrogen, helium; up to 105 MPa; bubble testing, helium mass spectrometer leak detection)
Pressure cycling testing (water, hydrogen; up to 105 Mpa)
Temperature cycling testing (-40°C to +150°C)
Environmental testing (corrosion, aging, ozone)
Flow testing, electrical testing
Fire resistance, cracking, drop, vibration, and gunshot testing

Based on Standards

GTR NO.13、CGH2R-12b 、SAE J2579、EU2019/2144、EN 12245、ISO11119、ISO 19881、ISO/DIS 15869、ECE R134、JARI S 001 002、JIGA-T-S、KHKS0128、T/GDASE 0017、T/CATSI 02007、GB/T 35544、GB/T 34872、GB/T 26990、GB/T 29126、TSG R0009、GB/T 26779、GB/T 30718、SAE J2600、GB/T 34425、SAE J2601、TSG 21、GB 150、GB/T 26466、GB/T 34583、TZJASE001、API 618、GB/T3853、GB/T 15487、SH/T 3143、T/CCGA40005, etc.

PROJECT MANAGEMENT

Customer Needs Communication

Product Design

Supply Chain Management

Production

Final Assembly and Commissioning

Product Delivery

Product Service

- Professional Project Team
- Customized Solutions
- High-standard Delivery Process
- Comprehensive Maintenance Service

SERVICE CAPABILITY >>>

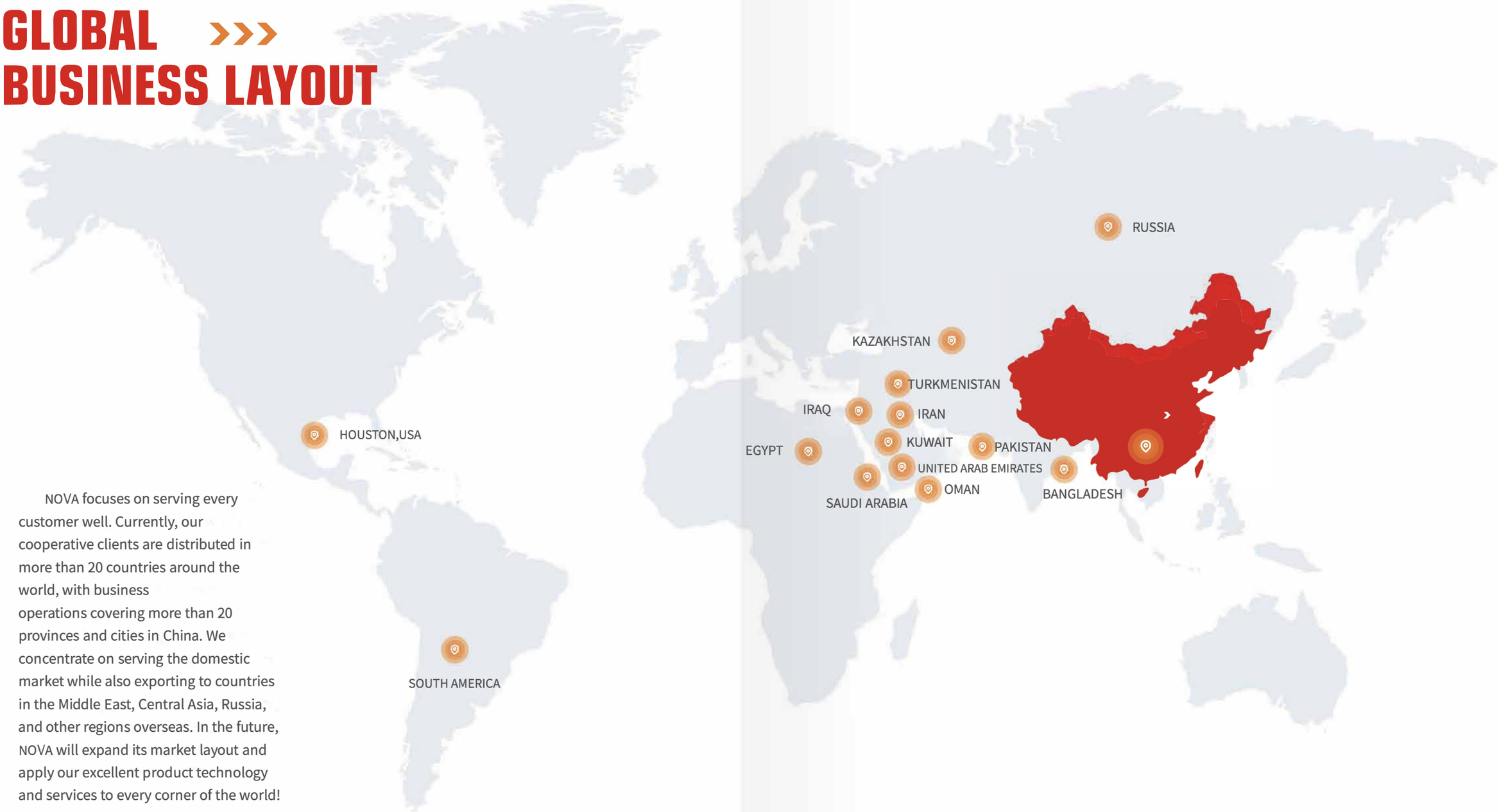
adheres to the service philosophy of "Quality First, Safety First, Service First", and provides customers with comprehensive and satisfactory services.

Localized Service: The company has established several service offices in major regions including Shenzhen, Tianjin, Chengdu, Xinjiang, and Puyang to provide convenient and high-quality localized services to customers across the country. The company can respond within 24 hours or arrive at the site within 72 hours to solve problems.

One-stop Professional Service: The company provides customers with one-stop service and integrated solutions, from research and development to installation and commissioning, technical training, to meet or exceed customer expectations, establish an impressive and significantly differentiated brand, and win good customer reputation and market performance.

- Professional Technical Team Service
- Thoughtful service from beginning to end
- Fast response service at all times
- Customer-oriented continuous improvement

GLOBAL BUSINESS LAYOUT



NOVA focuses on serving every customer well. Currently, our cooperative clients are distributed in more than 20 countries around the world, with business operations covering more than 20 provinces and cities in China. We concentrate on serving the domestic market while also exporting to countries in the Middle East, Central Asia, Russia, and other regions overseas. In the future, NOVA will expand its market layout and apply our excellent product technology and services to every corner of the world!