KINTEK SOLUTION

Vacuum Heated Lab Press Catalog

Contact us for more catalogs of Laboratory Press Machine, Battery Testing & Electrochemical Equipment, Electrode Fabrication Equipment, Cell Assembly & Filling Equipment, Battery Lab Consumables & Materials, etc.

KINTEK SOLUTION

COMPANY PROFILE

>>> About Us

KINTEK Solution is a technology-driven innovator specializing in comprehensive laboratory equipment for battery R&D and advanced materials research. Our portfolio spans the entire cell fabrication workflow—from mixing, coating, and precision pressing (automatic, heated, isostatic) to cell assembly and testing. Also essential in ceramics and powder metallurgy, our systems prioritize precision, safety, and repeatability, empowering researchers and industrial labs to achieve groundbreaking results.

Heated Hydraulic Press Machine With Heated Plates For Vacuum Box Laboratory Hot Press

Item Number: PCVM

Introduction

Enhance lab precision with KINTEK's Heated Vacuum Lab Press for uniform, oxidation-free samples. Ideal for sensitive materials. Get expert advice now!

Learn More

Instrument model	PCVM-10T
Pressure Range	0-10.0 tons
Pressurization process	Manual pressurization
Heating temperature	Maximum 500°C
Heating plate	180x180mm, 200x200mm (customizable options may be available)
Vacuum box material	SUS 304 (stainless steel)
Studio Size	400x400x400mm
Door size	300x350mm
Vacuum degree	-0.1MPa
Dimensions (LxWxH)	450x550x850mm
Power supply	220V 50Hz (110V option available)

Compact Benchtop Programmable Vacuum Hot Press For Battery Electrode Bonding And Material Processing

Item Number: XP30

Introduction

Benchtop programmable vacuum hot press delivering 10-ton hydraulic force, precision PID temperature control up to 500°C, and a vacuum or inert gas environment. Designed for battery electrode bonding, polymer lamination, and advanced materials research in a compact benchtop format.

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Application	Description	Key Benefit
Battery Electrode Bonding	Laminating cathode/anode materials onto current collectors under heat and pressure in vacuum or inert gas.	Uniform contact and minimal oxidation, enhancing electrochemical performance and cycle life.
Solid-State Electrolyte Pressing	Compacting and sintering solid electrolyte powders into dense pellets for next-generation batteries.	High density and reduced porosity improve ionic conductivity and mechanical stability.
Polymer Lamination	Bonding polymer films or sheets for electronic packaging, medical devices, or flexible displays.	Precise temperature/pressure control prevents bubbles and delamination, ensuring optical clarity and bond strength.
Composite Material Fabrication	Consolidating metal, ceramic, or carbon-fiber prepregs into high-performance composite panels.	Eliminates voids and improves interlaminar shear strength through vacuum-assisted pressing.
Powder Metallurgy Compaction	Compacting metal or ceramic powders into near-net shape preforms under vacuum to prevent oxidation.	Achieves high green density and uniformity, reducing sintering shrinkage and distortion.
MEA (Membrane Electrode Assembly) Hot Pressing	Bonding the proton exchange membrane to catalyst layers in fuel cell manufacturing.	Precise pressure distribution and inert atmosphere preserve catalyst activity and membrane integrity.
Advanced Ceramics Sintering	Pressure-assisted densification of technical ceramics such as alumina, zirconia, or silicon nitride.	Reduces sintering temperature and dwell time while achieving near-theoretical density.

Parameter	XP30-STD (Standard)	XP30-HT (High-Temp)	Notes
Model Designation	XP30-STD	XP30-HT	Selectable thermal module
Platen Working Temperature	RT – 300 °C	RT – 500 °C	Programmable PID touchscreen control
Heater Power	2400 W	≤ 3600 W	Symmetrical heating elements
Max Working Pressure	≤ 10 Tons (100 kN)	≤ 10 Tons (100 kN)	Rated at ambient (cold) state
Pressure Control	Touchscreen controller with auto-compensation	Touchscreen controller with auto-compensation	Multi-segment programmable
Platen Dimensions	180 mm × 180 mm	180 mm × 180 mm	Dual heated platens
Platen Opening (Daylight)	60 mm	60 mm	Optimized for thin-profile samples
Vacuum Level (Relative)	≤ -0.1 MPa	≤ -0.1 MPa	Measured at chamber gauge
Vacuum Level (Ultimate)	—	Up to 1×10^{-3} Torr	Achievable with external pump station
Atmospheric Gas Compatibility	N_2 / Ar	N_2 / Ar	Inert gas purging and backfilling
Cooling Method	Circulating water cooling	Circulating water cooling	Built-in platen water channels

Parameter	XP30-STD (Standard)	XP30-HT (High-Temp)	Notes
Power Supply	AC 220V / 60Hz	AC 208V – 220V / 60Hz	60Hz grid, single-phase
Safety Certification	CE	CE	Fully certified

Package	Included Pump	Max Temp	High-Temp Gloves	Recommended For
Base	External port only (no pump)	300 °C (XP30-STD)	Optional	Budget-conscious labs with existing vacuum pump
External Pump Station	External high-performance rotary vane pump station	500 °C (XP30-HT)	Optional	Applications requiring clean isolation or deep vacuum
Standard Integrated	Built-in rotary vane pump	500 °C (XP30-HT)	Included (1 pair)	Self-contained, turnkey operations with minimal footprint

Heated Hydraulic Press Machine With Heated Plates For Vacuum Box Laboratory Hot Press

Item Number: PCV

Introduction

KINTEK Heated Hydraulic Lab Press with Vacuum Box ensures precise sample preparation. Compact, durable, and featuring digital pressure control for superior results.

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Instrument model	PCV-10T1818	PCV-10T2020
Pressure Range	0-10.0 tons	0-10.0 tons
Pressurization process	Manual pressurization	Manual pressurization
Heating temperature	Maximum 500°C	Maximum 500°C
Heating plate	180×180mm	200×200mm
Vacuum box material	SUS 304 (stainless steel)	SUS 304 (stainless steel)
Studio Size	400×400×400mm	400×100×400mm
Door size	300×350mm	300×350mm
Vacuum degree	-0.1MPa	-0.1MPa
Dimensions	450×550×850(L×W×H)	450×550×850(L×W×H)
Power supply	220V50Hz (can support 110V)	220V50Hz (can support 110V)

40 Ton 400X400Mm Vacuum Hot Press With Independent Temperature And Pressure Control

Item Number: XP24

Introduction

40-ton vacuum hot press with 400x400mm platens, high-vacuum chamber, dual gas inlets, and programmable temperature-pressure profiles for precision material processing. Ideal for battery, ceramic, composite, and polymer research. Engineered for demanding lab environments with uniform heating and closed-loop frame.

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Application	Description	Key Benefit
Li-Ion Battery Electrode Densification	Vacuum hot pressing of cathode/anode films (e.g., NMC, LFP) to achieve target porosity and enhance electrical conductivity.	Uniform compaction force eliminates density gradients, boosting energy density and cycle life.
Solid-State Battery Layer Lamination	Laminating electrolyte separators with lithium metal anodes under vacuum to avoid interfacial voids and oxidation.	Ultra-clean bonding interfaces ensure low ionic resistance and superior cell safety.
Advanced Ceramic Sintering	Pressure-assisted densification of engineering ceramics (alumina, zirconia, silicon carbide) at high temperature in vacuum or inert gas.	Reaches near-theoretical density with fine grain structure, enhancing mechanical strength and wear resistance.
Powder Metallurgy Compaction	Compressing metal or alloy powders into near-net shape preforms with reduced porosity, followed by sintering.	High green density leads to improved material homogeneity and less shrinkage during sintering.
CFRP and Composite Molding	Curing carbon fiber reinforced prepregs under heat and pressure while vacuum evacuates air to eliminate delamination.	Lightweight structural parts with minimal void content for aerospace and automotive applications.
Microfluidic Chip Fabrication	Hot embossing of thermoplastic substrates (PMMA, COC) using precision-machined molds under vacuum for bubble-free replication.	High-fidelity feature transfer down to micron dimensions, essential for lab-on-a-chip devices.
Sputtering Target Bonding	Bonding indium or other bond layers between target material and backing plate under controlled heat and pressure in vacuum.	High bond integrity and thermal conductivity for reliable thin-film deposition runs.
High-Performance Polymer Processing	Compression molding of PEEK, PEKK, and other high-temp thermoplastics under vacuum to prevent oxidative degradation.	Consistent mechanical properties and surface finish for demanding medical or semiconductor components.

Module	Parameter	Specification
General	Model	XP24
Force	Maximum Working Pressure	0–40 Tons (0–400 kN), continuously adjustable via hydraulic precision pressure control
	Effective Platen Area	400 × 400 mm
	Platen Surface Flatness	≤ 0.05 mm across entire surface
	Load Frame Design	Rigid four-column closed-loop frame, net weight 600 kg, minimal elastic deformation at full load
Thermal	Temperature Range	Room temperature to 300°C (maximum design temperature 320°C)
	Heating Power	5.5 kW (5500 W), 380V 3-phase, resistive heating element matrix
	Heating Rate	2–5°C/min, dependent on tooling and sample thermal mass

Module	Parameter	Specification
	Cooling System	Integrated dual water-cooling channels in platens; requires external chiller (recommended capacity ≥2.0 kW, 15–25°C water)
	Thermal Protection	Insulator barriers between heated platens and hydraulics prevent heat migration
Vacuum & Atmosphere	Chamber Material	SUS304 stainless steel, thick-walled, internal mirror polish for low outgassing
	Vacuum Level	Static vacuum down to -0.1 MPa (approx. 10 Pa) via external vacuum pump
	Leak Detection	High-pressure nitrogen and helium mass spectrometer tested for chamber integrity
	Gas Supply	Dual independent channels for N_2/Ar with precision micro-flow control and safety exhaust valve
Utility & Installation	Power Requirement	AC 380V, 50Hz, 3-phase + neutral + PE (5-wire); recommended circuit breaker 16A, 3P+N+PE with leakage protection; cable cross-section ≥4 mm^2 copper
	Vacuum Pump Requirement	External pump with displacement ≥4 L/s, oil-mist filter or dry scroll type recommended
	External Dimensions (W×D×H)	900 × 850 × 1300 mm (floor-standing, require solid, level concrete floor)
	Net Weight	Approx. 600 kg
	Cooling Water Interface	Quick-connect fittings for external chiller connection

Programmable Vacuum Hot Press Benchtop System For Advanced Material Synthesis

Item Number: XP35

Introduction

KINTEK's programmable vacuum hot press: benchtop 10-ton hydraulic press with vacuum/inert gas, 400°C & 800°C configurations for battery lamination, diffusion bonding, powder metallurgy.

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Application	Description	Key Benefit
Battery Pouch-Cell Lamination	Bonding and sealing of lithium-ion battery electrodes and separators under precise temperature, pressure, and inert gas.	Eliminates voids, prevents oxidation at electrode interfaces, and improves cell impedance and longevity.
Polymer Film Lamination & Encapsulation	Multilayer bonding for flexible electronics, optical films, or barrier packaging using controlled heat and force.	Achieves optically clear, defect-free bonds with consistent thickness and zero residual stress.
Powder Metallurgy Compaction	Uniaxial pressing of metal or ceramic powders into high-density green bodies, often followed by in-situ sintering under vacuum or inert gas.	Increases sintered density, reduces porosity, and enhances mechanical strength and electrical conductivity.
Diffusion Bonding of Advanced Alloys	Solid-state joining of dissimilar metals or high-temperature alloys at elevated temperatures in a clean vacuum environment.	Creates high-integrity, contamination-free interfaces for aerospace, nuclear, and medical components.
Ceramic Matrix Composite Lamination	Consolidation of ceramic prepregs or fiber-reinforced green tapes under heat and pressure.	Ensures uniform resin distribution, minimal void content, and improved interlaminar shear strength for demanding structural applications.
Thermoelectric & Piezoelectric Material Synthesis	Processing of novel functional materials under precisely controlled thermal and atmospheric conditions.	Enables reproducible phase formation and densification, critical for optimizing energy conversion and sensor performance.
Vacuum Lamination of Solar Cell Encapsulants	Bonding of encapsulant layers onto photovoltaic cells with minimal thermal degradation.	Protects against moisture ingress and improves module reliability in outdoor installations.
Hermetic Sealing of MEMS & Sensor Packages	Vacuum-assisted sealing of micro-electromechanical systems (MEMS) or optical sensor packages under inert gas.	Achieves leak-tight seals with controlled internal atmosphere, extending device lifetime and accuracy.

Parameter	XP35 Standard Edition	XP35 Extreme High-Temp Edition
Max Working Pressure	Up to 10 Tons (100 kN)	Up to 10 Tons (100 kN)
Max Platen Temperature	≤ 400 °C	≤ 800 °C
Platen Material	Standard Tool/Die Steel	Nickel-based Superalloy
Rated Heating Power	≤ 3200 W	4500 W
Platen Dimensions	150 mm × 150 mm	150 mm × 150 mm
Platen Opening (Daylight)	≤ 60 mm	50 mm
Pressure Control	Programmable touchscreen (auto-pressurize, hold, timed release)	Programmable touchscreen (auto-pressurize, hold, timed release)
Chamber Vacuum Level	–0.1 MPa (Relative)	–0.1 MPa (Relative)
Atmospheric Gas	Nitrogen (N_2) / Argon (Ar)	Nitrogen (N_2) / Argon (Ar)

Parameter	XP35 Standard Edition	XP35 Extreme High-Temp Edition
Chamber Material	SUS 304 Stainless Steel	SUS 304 Stainless Steel
Safety Systems	Standard over-pressure relief	Auto door shutdown, over-pressure & over-temperature interlocks
Power Supply	AC 220 V / 50 Hz (Single Phase)	AC 208 V – 240 V / 60 Hz
Certification	CE compliant	CE compliant

30T Electric Vacuum Hot Press

Item Number: XP23

Introduction

KINTEK's electric vacuum hot press is designed to deliver precise temperature and pressure control up to 300°C and 30 tons, with inert gas environment, programmable multi-stage recipes, and fast active cooling, ideal for battery research and advanced materials processing.

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Application	Description	Key Benefit
Lithium-Ion Battery Electrode Pressing	Hot-pressing of cathode and anode films onto current collectors to improve interfacial adhesion and electrode density.	Uniform pressure and temperature eliminate delamination and reduce internal resistance, increasing cell performance.
Solid-State Battery Electrolyte Densification	Compaction of sulfide or oxide solid electrolytes under argon atmosphere to achieve high ionic conductivity without moisture contamination.	Inert environment preserves phase purity and ionic transport properties.
Advanced Composite Lamination	Multi-layer bonding of prepregs, thermoplastic films, or carbon fiber sheets for aerospace and automotive prototypes.	Programmable pressure and cooling ensure void-free laminates with consistent thickness.
Technical Ceramic Sintering	Pressure-assisted sintering of alumina, zirconia, or silicon nitride substrates under vacuum to remove binders and achieve full density.	Combination of vacuum extraction and precise thermal profiling yields defect-free ceramic parts.
Metal Matrix Composite (MMC) Fabrication	Warm pressing of metal powders (e.g., Al, Cu) reinforced with ceramic particles for thermal management or wear-resistant components.	Fast cooling after pressing limits grain growth, enhancing mechanical and thermal properties.
Hot Embossing of Polymer Films	Micro-structuring of thermoplastic films for microfluidic devices or optical components using heated plates and controlled force.	Accurate force and temperature control replicate fine features with high fidelity.
Thin-Film Laminate Sealing	Laminating barrier films for OLED or organic photovoltaic encapsulation in a moisture-free, oxygen-free environment.	Inert atmosphere prevents oxidation of sensitive organic layers during bonding.
R&D Material Synthesis	Exploring new material formulations and bonding processes with flexible recipe definition and comprehensive data logging.	Rapid iteration and data export accelerate material discovery and process scale-up.

System Subassembly	Parameter Description	Technical Standard
Model	–	XP23
Pressure System	Maximum Working Force	0 – 30 Tons (0 – 300 kN)
Pressure System	Platen Dimensions	400 × 400 mm
Pressure System	Pressure Controller	Programmable Touchscreen PLC
Thermal System	Working Temperature	Ambient – 300 °C
Thermal System	Heating Power	5600 W (5.6 kW)
Thermal System	Heating Rate	2 – 5 °C / min
Thermal System	Temperature Controller	Programmable Touchscreen PLC
Thermal System	Platen Cooling Method	Circulating Water Cooling (internal channels)
Environment Control	Vacuum Level	-0.1 MPa (rough vacuum configuration)
Environment Control	Vacuum Chamber Material	SUS 304 Stainless Steel

System Subassembly	Parameter Description	Technical Standard
Environment Control	Process Atmosphere	Nitrogen (N_2) / Argon (Ar) Inert Gases
Facility & Utility	Power Supply	AC 220V / 50Hz (380V 3-Phase optional upon request)
Facility & Utility	Dimensions (Chamber & Control Cabinet)	550 × 600 × 850 mm

10T Vacuum Automatic Hot Press For Precision Lab Pressing

Item Number: XP32

Introduction

High-precision benchtop 10T vacuum automatic hot press with 200x200mm heated platens and rapid vacuum pump for polymer curing, battery electrode bonding, and materials research. Ideal for lab environments requiring uniform heating and precision pressure control, CE certified with programmable touchscreen.

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Application	Description	Key Benefit
Polymer Film Lamination	Laminating polymer sheets or films under heat and vacuum to create multilayer structures.	Uniform pressure and temperature prevent warping and voids.
Battery Electrode Bonding	Bonding electrode materials onto current collectors for lithium-ion or solid-state batteries.	Inert gas purge prevents oxidation, ensuring high conductivity.
Powder Compaction (with Dies)	Compacting metal, ceramic, or composite powders into dense pellets using a smaller die.	High pressure up to 50.9 MPa achievable with ∅50 mm die.
Thin-Film Processing	Curing and annealing thin films for electronics and sensor applications.	Precise temperature control up to 300°C with vacuum environment.
Ceramic Sintering	Initial stage sintering of ceramic green bodies under combined heat and pressure.	Reduced porosity and improved mechanical properties.
Composite Material Curing	Curing carbon fiber or glass fiber composite prepregs.	Even pressure distribution ensures lamination quality.
Organic Electronics Encapsulation	Encapsulating sensitive organic electronic devices under inert atmosphere.	Oxygen-free environment extends device lifetime.

Parameter	Specification	Notes
Model	XP32	Automatic heated vacuum press
Max Working Pressure	≤ 10 Tons (100 kN)	Controlled via programmable system
Pressure Accuracy	± 0.1 Ton (1 kN)	High-precision load feedback
Platen Working Temp	Room Temp (RT) – 300 °C	Programmable PID touchscreen
Heating Power	3500 W	High-density heating element array
Platen Dimensions	200 mm × 200 mm	Ground flat platens
Platen Opening (Daylight)	50 mm	Compact opening for fast vacuum cycle
Vacuum Pump Included	Rotary Vane Mechanical Pump	Standard inclusion
Vacuum Pump Displacement	240 L/min (8.5 CFM)	High-speed evacuation capacity
Ultimate Vacuum Level	<−0.1 MPa	Relative gauge pressure
Working Atmosphere	Nitrogen (N_2) / Argon (Ar)	Vacuum-and-purge compatible
Power Supply	AC 208V / 60Hz (Single Phase)	Optimized for US institutional facilities
Certification	CE Certified	Standard safety compliance

Option	Standard Controller (Included)	Advanced Industrial PLC Upgrade (Optional)
Interface	7-inch color touchscreen	Siemens industrial PLC with high-res touchscreen
Core Functions	Basic PID temperature profiling, target pressure input, auto-holding, automated timed decompression	Complex multi-step temperature/pressure profiling, recipe storage (up to 99 profiles), precision load-cell feedback, Ethernet data logging
Best For	Standard lamination, polymer curing, simple pellet pressing	Academic research, ASTM test standards, processes requiring precise step-by-step pressure compensation

Benchtop Automatic Vacuum Hot Press For Advanced Material Processing

Item Number: XP28

Introduction

High-precision benchtop automatic vacuum hot press delivering 25 tons of force, dual large-area heated platens up to 300°C, oil-free clean vacuum, programmable multi-stage pressing for repeatable results. Perfect for solid-state battery fabrication, polymer film lamination, and advanced material development.

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Application	Description	Key Benefit
Solid-State Battery Electrolyte Pressing	Processing sulfide or oxide solid electrolytes under vacuum and controlled heat to bond them with electrode materials, forming dense, ion-conductive interfaces. This eliminates voids that cause impedance, improving overall cell performance.	Achieves high ionic conductivity and mechanical cohesion without contamination.
Polymer Thin-Film Lamination	Hot pressing multi-layer polymer films under vacuum to encapsulate flexible electronics or create FPC substrates. The vacuum environment ensures no trapped air bubbles, while uniform heat and pressure enhance bond strength.	Produces optically clear, uniform laminates with excellent peel strength and reliability.
XRF / FTIR Pellet Preparation	Compacting powdered analytical samples into pellets under vacuum to prevent moisture adsorption and oxidation. Ideal for preparing stable samples for spectroscopic analysis where surface smoothness and consistency are critical.	Delivers reproducible, contamination-free pellets for accurate elemental or structural analysis.
Ceramic Matrix Composite (CMC) Curing	Vacuum-assisted hot pressing of pre-ceramic polymer infiltrated fabrics or prepregs to consolidate layers and remove volatiles before high-temperature pyrolysis. This step is crucial for achieving high density in final components.	Reduces porosity and enhances densification, leading to superior mechanical and thermal properties.
Pouch Cell Lamination & Sealing	Assembling electrode-separator stacks and sealing aluminum laminate pouch films under heat and vacuum for lithium-ion battery prototyping. The controlled environment ensures robust sealing and uniform electrode compression.	Creates hermetically sealed cells with optimized electrode contact, extending cycle life.
Aerospace Composite Panel Pressing	Pressing carbon or glass fiber prepregs under vacuum to achieve low void content and high fiber volume fraction for structural aircraft components. The oil-free vacuum avoids contamination that could compromise mechanical properties.	Meets stringent aerospace standards for strength, lightweight, and outgassing.
Membrane Electrode Assembly (MEA) Hot Pressing	Bonding catalyst-coated membranes with gas diffusion layers under precisely controlled heat and pressure in a vacuum, critical for fuel cell and electrolyzer performance.	Maximizes electrochemically active surface area and reduces interfacial resistance.

Parameter	Specification	Notes
Model	XP28	Automatic vacuum heating hot press
Maximum Design Load	25 Tons (250 kN)	Auto servo-hydraulic control
Force Control Range	0.3T – 25T	Minimum adjustable pressure is 0.3T
Force Resolution	±0.01T	High-resolution stepper control
Pressing Program	Auto-pressurize, step pressurize, auto-holding, pressure compensation, timed decompression	Stage times are unlimited and configurable
Real-time Stress Calculation	Automatic conversion to MPa	Input die/mold diameter via touchscreen
Vacuum Level	-0.1 MPa	Relative gauge pressure
Vacuum Pump Configuration	Electric chemical-resistant dry vacuum pump	Standard inclusion (oil-free)

Parameter	Specification	Notes
Heating Temperature Range	Room Temperature (RT) to ≥300 °C	0.1 °C steps
Temperature Control	Programmable multi-stage heating & holding	Unlimited stage holding times
Platen Size (Each)	180 mm × 180 mm	Dual heated platens
Platen Clearance (Daylight)	≥ 60 mm	Designed for flat molds, films, and sheets
Cooling Method	Natural cooling	Optional forced-air or water cooling chiller
Power Supply	Single-phase AC 220V ± 16%, 50Hz	Complies with HK and international standards
Safety Features	Overpressure auto-release + emergency stop + visual high-temp alert	High-temp warning triggers above 50 °C
Certification	CE certified	

15-Ton Automatic Vacuum Hot Press With 200X200Mm Heated Platens And Water Cooling

Item Number: XP33

Introduction

Explore KINTEK's automatic 15-ton vacuum hot press: 200x200mm heated platens (up to 500°C), precise PID control, water cooling, and SUS 304 chamber for vacuum or inert gas processing—perfect for battery pouch cells, polymer lamination, and diffusion bonding.

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Application	Description	Key Benefit
Battery Pouch Cell Lamination	Lamination of pouch cells for lithium-ion or solid-state batteries requires uniform pressure and heat to bond layers without damaging the electrolyte. The vacuum capability removes moisture and gases, preventing delamination and enhancing cell longevity.	Eliminates delamination, improves ionic conductivity, and extends cycle life.
Polymer Film Lamination	Laminate polymer sheets or composite films for electronics encapsulation, medical packaging, or flexible displays under controlled temperature and pressure.	Produces bubble-free, high-clarity bonds with precise thickness control.
Diffusion Bonding	Join metals, alloys, or ceramics at elevated temperatures under high vacuum without melting, creating atomic diffusion bonds.	Achieves high-strength, pore-free interfaces ideal for heat exchangers and microfluidic devices.
Powder Compaction and Sintering	Compress metal or ceramic powders in a die under vacuum and heat to form dense pellets or preforms.	Enhances density, reduces porosity, and improves mechanical and electrical properties.
Composite Material Curing	Cure advanced fiber-reinforced composites with precise pressure and temperature profiles in an inert atmosphere.	Optimizes cross-linking, prevents oxidation, and ensures void-free laminates.
Flexible Electronics Assembly	Laminate and encapsulate flexible circuits, OLED displays, or thin-film sensors with heat-activated adhesives under vacuum.	Maintains alignment, eliminates outgassing defects, and protects sensitive components.

Specification	Value / Details
Model	XP33
Max Working Pressure	≤ 15 Tons (150 kN)
Platen Working Temperature	Room Temperature – 500 °C, programmable PID touchscreen
Heating Power	3000 W
Platen Dimensions	200 mm × 200 mm
Platen Opening (Daylight)	50 mm
Vacuum Pump Included	Rotary Vane Vacuum Pump (standard)
Vacuum Level (Relative)	< -0.1 MPa
Chamber Material	SUS 304 Stainless Steel
Atmospheric Gas Compatibility	Nitrogen (N_2) / Argon (Ar)
Cooling Method	Circulating Water Cooling (both platens)

Specification	Value / Details
External Dimensions	650 × 492 × 725 mm
Net Weight	235 kg
Power Supply	AC 220V / 50Hz, Single Phase

15T High Vacuum Hot Press System For Diffusion Bonding And Sintering

Item Number: XP31

Introduction

The 15T high vacuum hot press system delivers precise 500°C heating and high vacuum performance via turbomolecular pump achieving 6×10^{-4} Pa for diffusion bonding sintering and processing of oxygen-sensitive advanced materials. Ideal for research labs. Contact KINTEK for quote.

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Application	Description	Key Benefit
Diffusion Bonding of Micro-Interfaces	Vacuum bonding of thin-film semiconductors, thermoelectric joints, and single crystals without interfacial oxides.	Achieves high-strength, contamination-free bonds critical for electronic and photonic devices.
Sintering of Oxygen-Sensitive Ceramics	Densification of technical ceramics, nitrides, and sulfides under pure vacuum or inert atmosphere.	Produces high-density, high-purity components with superior mechanical and electrical properties.
High-Pressure Micro-Pellet Compacts	Fabrication of small, dense pellets for spectroscopy or mechanical testing using exact pressures.	Ensures uniform density and phase integrity in sample preparation.
Thermoelectric Materials Processing	Pressing and sintering of thermoelectric alloys under vacuum to prevent compositional changes.	Enhances thermoelectric efficiency by preserving stoichiometry and reducing thermal conductivity.
Battery Electrode Compaction	Compacting electrode materials under controlled atmosphere for solid-state battery research.	Improves interfacial contact and reduces porosity, boosting electrochemical performance.
High-Temperature Alloy Densification	Densifying refractory alloys and composites using combined heat and pressure.	Achieves near-theoretical density while avoiding grain growth and oxidation.
Ceramic Matrix Composite Fabrication	Infiltration and consolidation of ceramic preforms with high-temperature matrices.	Creates dense, defect-free composites with enhanced mechanical toughness.
Semiconductor Device Packaging	Hermetic sealing and bonding of components under vacuum to ensure long-term reliability.	Prevents moisture and contaminant ingress, extending device lifespan.

Parameter	Specification
Model	XP31 – Cabinet-integrated high vacuum hot press
Max Hydraulic Force	15 Tons (150 kN)
Standard Pellet/Die Size	10 mm × 10 mm (refer to pressure safety guidelines below)
Working Temperature Range	Room temperature to 500°C, programmable PID touchscreen control
Heating Power	2100 W
Ultimate Vacuum Level	6×10^{-4} Pa (achieved via turbomolecular + rotary vane pump system)
Vacuum Pumps Included	Turbomolecular pump + Rotary vane pump
Vacuum Gauge	Digital high-vacuum gauge with real-time readout
Chamber Material	SUS 304 stainless steel
Atmospheric Gas Compatibility	Nitrogen (N_2) / Argon (Ar), vacuum-and-purge compatible

Parameter	Specification
External Dimensions	550 × 560 × 1100 mm
Power Supply	Single-Phase AC 220V / 50Hz

25 Ton 200X200Mm Vacuum Hot Press With Programmable P-T-T Control

Item Number: XP26

Introduction

Engineered for demanding laboratory applications, this 25-ton desktop vacuum hot press provides precise P-T-t synchronization, up to 500°C temperature range, inert gas/vacuum atmosphere, and adaptive power matching, enabling high-density sintering and bonding in solid-state battery, ceramic, and composite research. Compact, CE-certified system with dynamic pressure derating for long-term reliability.

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Application	Description	Key Benefit
Solid-State Battery R&D	Densification and solid-solid interface bonding of sulfide/oxide electrolytes under high temperature and pressure.	Chamber high airtightness allows long-term pressure-holding sintering under N_2/Ar, preventing active lithium oxidation.
Advanced Ceramics & Composites	Oxygen-free vacuum diffusion sintering of ceramic powders and non-metallic matrix composites.	SUS304 stainless steel chamber with -0.1 MPa vacuum rapidly removes volatile gases for defect-free components.
Flexible Electronics & MLCC	Multi-step heated lamination of polymer films and multilayer ceramic capacitors with delicate layers.	Programmable soft-start pressure as low as 100g prevents fracture of brittle thin sheets during initial pressing.
Diffusion Bonding of Metals	Atomic diffusion welding of dissimilar metals/alloys under high-temperature vacuum.	High-parallelism 200x200 mm ground platens ensure uniform stress distribution, minimizing voids and defects.
Powder Metallurgy Compaction	High-density consolidation of metal, ceramic, and composite powders under vacuum.	Eliminates trapped gases, reduces porosity, and enhances mechanical strength and electrical conductivity.

Parameter	Standard Configuration	Professional/Upgraded Configuration
Platen Size	200 × 200 mm	–
Maximum Temperature	300 °C (natural cooling)	500 °C (requires recirculating chiller)
Temperature Control Accuracy	≤ 3 °C	≤ 1 °C
Maximum Heating Rate	≤ 3 °C/min	–
Maximum Pressure (Cold State)	25 Tons (250 kN)	–
Maximum Pressure (Hot State)	–	15 Tons (150 kN) @ 500°C
Pressure Control Accuracy	±0.1 Ton (closed-loop feedback)	–
Daylight Opening	50 mm	100 mm (suitable for large molds)
Heating Power	1800 W / 2400 W	3000 W / 3500 W
Vacuum Chamber Size	–	400 × 400 × 400 mm
Chamber Material	SUS 304 Stainless Steel	–

Parameter	Standard Configuration	Professional/Upgraded Configuration
Ultimate Vacuum	-0.1 MPa (with 240 L/min dual-stage pump)	–
Platen Cooling Method	Ambient air	External recirculating chiller
Control Interface	7-inch programmable PLC touchscreen	–
Power Supply Options	AC 220 V / 50 Hz	AC 110 V / 60 Hz or AC 440 V / 60 Hz
Net Weight (approx.)	270 kg (varies by configuration)	–
Compliance	CE certified	–

Precision Servo Driven Electric Vacuum Hot Press For Battery Research And Advanced Material Processing

Item Number: XP22

Introduction

Precision servo-driven electric vacuum hot press with compact 260mm chassis, programmable 7-inch touchscreen, oil-free actuation, and high-temperature capability for battery research and advanced material consolidation. Ideal for producing dense, uniform films and solid-state electrolytes with precise pressure and temperature control.

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Application	Description	Key Benefit
Solid-State Battery Electrolyte Films	Vacuum hot pressing of sulfide or oxide electrolyte powders into dense, thin films under precisely controlled temperature and pressure.	Minimizes resistive interfaces and enhances ionic conductivity through uniform microstructure.
Lithium-Ion Electrode Calendering	Post-coating compression of cathode and anode materials to improve active material contact and density under vacuum.	Boosts energy density and rate performance while reducing cell internal resistance.
Polymer Separator & Membrane Molding	Fabrication of microporous or dense polymer membranes with adjustable thickness via gap-controllable molds.	Achieves consistent thickness tolerance (±1 μm) and surface flatness for critical separation applications.
Advanced Composite Lamination	Multi-layer thermal bonding of functional films, foils, and nonwovens for flexible electronics or packaging.	Reliable interlaminar adhesion without delamination, even with dissimilar materials.
Ceramic Powder Compaction	Near-net-shape compression of ceramic preforms under vacuum, followed by sintering to achieve high-density ceramics.	Reduces porosity to near-zero levels, improving mechanical and thermal properties.
High-Performance Ceramic Substrates	Vacuum hot pressing of ceramic tapes for electronic substrate applications.	Eliminates voids and warpage, yielding perfectly flat, dense substrates with excellent thermal conductivity.
Academic Material Research	Versatile platform for exploratory synthesis of novel alloys, thermoelectrics, or bio-materials requiring clean, programmable heating/pressing.	Rapid iteration with reproducible parameter control, accelerating publication-ready results.

Specification	Standard Configuration	Optional Upgrades / Performance Core	Remarks
Model	XP22	—	Precision servo-driven electric vacuum hot press
Actuation Type	Pure servo-electric, oil-free	—	Eliminates hydraulic fluid contamination
Max Pressing Force	0 – 3.0 Tons (0 – 30 kN)	0 – 5.0 Tons (0 – 50 kN) with fast-heating electrode array; 0 – 10.0 Tons (0 – 100 kN) high force	0.01 Ton resolution with intelligent load compensation
Force Resolution	0.01 Ton	—	Intelligent micro-step compensation for precision loading
Platen Size	180 × 180 mm	—	High-rigidity die steel platens
Platen Daylight (Opening)	50 mm	60 mm or 65 mm	Accommodates thicker molds or multi-layered assemblies
Maximum Operating Temperature	Standard (not specified, typically ≤200°C)	Up to 300°C (with high-temperature package)	Suitable for polymer melting, ceramic sintering, and metal annealing
Heating Method	Embedded dual-platen independent heaters	Optional high-temperature package	Water-cooled channels integrated for rapid cooling

Specification	Standard Configuration	Optional Upgrades / Performance Core	Remarks
Temperature Control	7-inch programmable touchscreen, multi-segment profiling	—	Aura-Touch™ interface; real-time curve display, recipe storage
Cooling System	Built-in water-cooling channels	Compatible with external closed-loop chiller (e.g., CW-3000)	Standard feature for platen cooldown and seal protection
Chassis Dimensions (W×D×H)	260 × 347 × 422 mm (narrow design)	300 × 300 × 420 mm (classic design)	2025 narrow chassis vs. 2024 classic; net weight 130 kg vs. 100 kg
Electrical Standard	AC 220-230V, 50Hz, single phase	110V/60Hz (North America); 220V/60Hz (Korea)	All configurations use standard laboratory single-phase power
Safety Features	Three-tier active electrical interlocks; CE certified	—	Full compliance with international safety directives
Optional Application Kits	—	KIT A: 100 µm square film tooling (+$300); KIT B: gap-adjustable sheet mold (+$300); KIT C: CW-3000 industrial water chiller	Seamless integration with 180×180 mm platens
Warranty & Support	12-month warranty (consumables excluded)	—	Lifetime free technical consultation and spare parts supply

60-Ton Automatic Vacuum Hot Press For High-Density Material Consolidation

Item Number: XP19

Introduction

KINTEK's 60-ton automatic vacuum hot press achieves 305.6 MPa precision compaction at up to 500°C with Tungsten Carbide mold, delivering void-free consolidation. Ideal for powder metallurgy and battery research under -0.1 MPa vacuum. Ensures safety with triple interlock.

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Application	Description	Key Benefit
High-Performance Thermoplastics	Vacuum hot pressing of PEEK, PEI, PPS, and PI films or powders to eliminate micro-bubbles and voids.	Produces fully dense polymer components with superior chemical resistance, mechanical strength, and thermal stability for aerospace and medical implants.
Powder Metallurgy & Hard Metals	Ultra-high pressure sintering of WC-Co, borides, and cermets to achieve high green density.	Near-theoretical density parts with exceptional hardness, wear resistance, and fine grain structure, ideal for cutting tools and wear parts.
Diffusion Bonding / Diffusion Welding	Solid-state joining of dissimilar metals (Cu/Al, steel/ceramic) under high pressure and temperature without filler.	Creates void-free, high-strength joints with pristine interfaces, essential for microelectronics, optical assemblies, and nuclear reactor components.
Battery Electrode & Solid-State Electrolytes	Densification of LLZO, LATP, and composite cathode/electrolyte layers for all-solid-state batteries.	Enhances ionic conductivity and mechanical integrity by eliminating interfacial voids, a critical requirement for next-gen battery performance and safety.
Functional Ceramics	Sintering of piezoelectric (PZT), dielectric ($BaTiO_3$), and ferrite powders under vacuum to maintain stoichiometry and purity.	Maximizes electromechanical properties by achieving full density without organic contaminants or porosity, vital for advanced sensors and actuators.
Metal Matrix Composites (MMCs)	Infiltration and hot pressing of aluminum or titanium matrices reinforced with SiC, Al_2O_3, or carbon fibers.	Uniform particle distribution and full consolidation, improving specific strength, stiffness, and thermal conductivity for lightweight structural applications.
Sputtering Targets & Thin Film Precursors	Consolidation of high-purity metal or oxide powders into target blanks for physical vapor deposition (PVD).	Achieves full density and fine grain structure, ensuring uniform thin film deposition and extended target lifetime in semiconductor manufacturing.
Carbon-Carbon Composites	Vacuum hot pressing of carbon fiber preforms with pitch or resin matrix to create high-density C/C composites.	Achieves uniform densification with exceptional thermal and mechanical properties for aerospace, braking, and thermal management applications.
Additive Manufacturing (AM) Post-Processing	Densification of additively manufactured metal or ceramic parts to eliminate internal porosity.	Transforms low-density AM prototypes into functional, fully dense components with improved fatigue life, strength, and surface finish.

Parameter	Specification
Model Number	XP19
Max Force	≤ 60.0 Tons (approx. 600 kN), auto-controlled
Active Pressure (on 50 mm mold)	~305.6 MPa
Mold Material	Tungsten Carbide (WC)
Mold Dimensions	Diameter: Φ 50 mm, Filling Height: 15 mm
Temperature Range	RT to 500°C, PID programmable
Vacuum Level	≤ -0.1 MPa (mechanical vacuum)

Parameter	Specification
Cooling System	Closed-loop water circulation (external chiller)
Power Supply	AC 220 V / 50 Hz, single phase
Certification	CE Certified

Interlock Mechanism	Protection Logic	Lab Safety Value
Door Limit Detection	Front door open triggers limit switch, cutting heating and pressurization instantly.	Prevents accidental contact with hot/pressurized zone, avoiding burns or crush injuries.
Pressure Overload Trip	Precision sensor detects overload >60 T; main relief valve opens and alarm sounds.	Protects the Tungsten Carbide mold from catastrophic failure due to over-pressure.
Thermal Runaway Fuse	Dual-redundant temperature monitoring; power cut if temperature exceeds 500°C.	Eliminates risk of thermal runaway, preserving vacuum chamber and sample integrity.

200 Ton Vacuum And Inert Gas Hot Press

Item Number: XP29

Introduction

Industrial 200-ton vacuum hot press with 400x400mm heated platens, PLC control, inert gas purging, and deep vacuum for uniform large-area laminating, bonding, and curing in battery and advanced material research applications. Precision engineering for consistent, repeatable results.

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Application	Description	Key Benefit
Large-Format Polymer & FPC Lamination	Void-free lamination of large-area polymer sheets, multi-layer Flexible Printed Circuits (FPC), and advanced composite panels under continuous vacuum.	Eliminates trapped air bubbles and ensures defect-free bonding, enhancing durability and electrical performance.
Semiconductor & Wafer Bonding	Low-profile vacuum-thermal bonding of large-diameter wafers, multi-chip modules, and substrates requiring precise temperature and pressure uniformity.	Achieves uniform interfacial contact and minimizes mechanical stress, preserving delicate microstructures.
Pouch Cell Battery Assembly	Precision flat-pressing of large pouch-cell battery electrodes and separator layers to optimize electrochemical contact and ion transport.	Increases energy density and cycle life by creating homogeneous electrode interfaces.
Advanced Ceramics & Composite Curing	Vacuum-assisted curing and consolidation of resin-matrix or ceramic-matrix composites at temperatures up to 250 °C.	Reduces porosity and enhances densification, improving mechanical strength and thermal stability.
Graphite Sheet Densification	Flattening and densifying flexible graphite films for thermal interface materials used in electronics cooling.	Achieves high in-plane thermal conductivity and uniform thickness for effective heat spreading.
Materials Research & Development	Processing experimental polymers, composites, and coatings under controlled vacuum/inert atmospheres to study structure-property relationships.	Provides precise environmental control for reproducible, high-fidelity scientific investigations.

Parameter	Specification	Notes
Model	XP29	Vacuum and inert gas hot press
Max Working Pressure	≤ 200 Tons (2,000 kN)	Managed via Siemens PLC control system
Pressure Sensor	Load cells	Real-time actual force monitoring
Platen Dimensions	400 mm × 400 mm	Large-area dual heated platens
Max Platen Temperature	≤ 250 °C	Programmable touchscreen control
Heating Power	≤ 6 kW	Symmetrical heating elements
Platen Opening Height	60 mm	Designed for sheets, laminates, and thin films
Vacuum Pump	Rotary vane mechanical vacuum pump	Standard inclusion (oil-sealed)
Ultimate Vacuum Level	≤ 10 Pa (approx. 0.1 mbar)	Deep rough-to-medium vacuum range
Working Atmosphere	Nitrogen (N_2) / Argon (Ar)	Vacuum-and-purge compatible
Purge Port	1/4" NPT	Equipped with manual vacuum ball valve
Observation Window	High-temperature resistant glass	For in-situ sample viewing
Control System	Siemens PLC with touchscreen HMI	Supports multi-segment recipe programming
Power Supply	AC 220V / 50Hz (Single Phase)	Requires dedicated min. 32A circuit breaker

Parameter	Specification	Notes
Safety Certification	CE compliant	Under HS Code: 8474802000

30 Ton 350X350Mm Vacuum Hot Press For Battery Research And Materials Processing

Item Number: XP27

Introduction

30-Ton laboratory vacuum hot press featuring 350×350mm work area, 300°C max temperature, multi-zone heating, precise ±0.1T pressure control, dual-loop water cooling, and PLC automation. Ideal for battery research, solid-state electrolyte processing, ceramic sintering, and advanced composite materials fabrication.

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Application	Description	Key Benefit
Solid-State Battery Electrolyte Processing	Densification of sulfide or oxide solid electrolyte layers between cathode and anode under vacuum, preventing moisture absorption and achieving high ionic conductivity.	Uniform density with minimal interfacial resistance, critical for next-generation battery performance.
Fuel Cell Membrane Electrode Assembly (MEA)	Hot-pressing catalyst-coated membranes with gas diffusion layers at precisely controlled temperature and pressure to produce uniform electrode assemblies for PEM fuel cells.	Enhanced bonding and consistent thickness across large-area MEAs, improving fuel cell efficiency and lifespan.
Polymer Film and Flexible Circuit Lamination	Multi-layer stacking of polymer films, adhesives, and copper foils for flexible printed circuits (FPC) and composite sheets, using custom temperature/pressure profiles.	Void-free lamination with excellent peel strength and dimensional stability.
Ceramic and Metal Powder Compaction	Pressing of ceramic or metallic powders into flat pre-forms prior to high-temperature sintering, achieving high green density and uniform particle packing.	Better sintered final density and mechanical properties with reduced post-processing time.
Carbon Fiber Reinforced Polymer (CFRP) Panel Forming	Consolidation of carbon fiber prepreg layers into thick or thin panels for aerospace and automotive R&D, using vacuum to eliminate air pockets.	Superior fiber-matrix adhesion and consistent thickness, enabling lightweight structural prototypes.
Wafer and Sensor Thermocompression Bonding	Binding of silicon wafers, glass, or thin-film sensors with thermoplastic adhesives in a vacuum environment to avoid bubble defects.	High-quality, bubble-free bonds essential for microelectronics and MEMS device reliability.
Sputtering Target Production	Hot pressing of ceramic or metal powders into dense sputtering targets under vacuum to eliminate oxides and reduce porosity.	Target materials with uniform density and composition, increasing film deposition quality and target utilization.
Functionally Graded Material (FGM) Research	Sequential pressing of multiple powder layers with differing compositions to create gradients in thermal or electrical properties for advanced applications.	Precise layer thickness and composition control, enabling exploration of novel material architectures.

Parameter	Standard Configuration	Optional & Custom Upgrades	Remarks
Working Pressure	30 Tons (300 kN)	–	Hydraulic system with over-pressure relief valve
Pressure Control Accuracy	±0.1 Ton	–	Closed-loop sensor feedback, automatic pressure maintenance
Pressure Control Method	PLC touchscreen programmable	–	Multi-step pressure, dwell, and automatic release programming
Platen Effective Size (W × D)	350 × 350 mm	–	High-precision surface grinding, minimal parallelism error

Parameter	Standard Configuration	Optional & Custom Upgrades	Remarks
Platen Opening Height	50 mm	80 mm / 100 mm (custom)	Larger openings require increased vacuum chamber height
Maximum Working Temperature	300 °C	–	Do not sustain 300 °C without water cooling
Heating Power	9,000 W (9 kW)	–	Matrix multi-zone heating element layout
Temperature Controller	7-inch color touchscreen PLC	–	Integrated pressure control, data export support
Cooling Method	Dual-loop internal water cooling	–	G1/2″ quick connectors; requires chilled water supply
Optional Cooling Module	User-supplied chilled water (≤25 °C)	2HP precision recirculating chiller	Chiller recommended for closed-loop, water-saving operation
Vacuum Chamber Material	SUS 304 stainless steel	–	High strength, corrosion resistant, low leak rate
Working Atmosphere	Nitrogen (N_2) / Argon (Ar)	Other non-reactive gases	Dual gas inlet control valves and manual vacuum break valve
Ultimate Vacuum Level	< -0.1 MPa	–	Dependent on pump speed and line sealing
Vacuum Pump Configuration	Two-stage rotary vane mechanical pump	–	Recommended pump displacement ≥ 240 L/min
Standard Power Supply	Three-phase AC 380V / 50Hz	Single-phase AC 220V / 50Hz (custom, requires ≥50A circuit breaker, ≥6mm² copper wire)	Three-phase strongly recommended for load balancing
Compliance	CE safety certified	–	Core electrical components with overload protection

30-Ton Heated Hydraulic Press For Advanced Polymer Synthesis Solid-State Battery Research And Ceramic Densification

Item Number: XP10

Introduction

KINTEK's 30-ton heated press delivers precise high-pressure compaction with integrated water cooling, programmable temperature controls, and glovebox compatibility for solid-state electrolyte, polymer, and ceramic research. Standard (110 kg) and Pro (150 kg) configurations, with optional recirculating chiller for rapid cooling.

Learn More

Warm Isostatic Press For Solid State Battery Research Warm Isostatic Press

Item Number: PCIH

Introduction

KINTEK Warm Isostatic Press (WIP) for precision lamination in semiconductors & solid-state batteries. ASME-certified, 50-100°C control, high-pressure capabilities. Enhance material performance now!

Learn More

Instrument model	PCIH-20T	PCIH-40T	PCIH-60T	PCIH-100T
Pressure Range	0-20T	0-40T	0-60.0 tons	0-100 tons
Piston diameter	130mm (d) in chrome plated oil cylinder	150mm (d) in chrome plated oil cylinder	200mm (d) in chrome plated oil cylinder	220mm (d) in chrome plated oil cylinder
Pressurization process	Program pressurization - Program holding-Timed pressure relief			
Hold time	1 second to 999 minutes	1 second to 999 minutes	1 second to 999 minutes	1 second to 999 minutes
Pressure conversion	The program automatically converts the pressure borne by the sample			
Display	7 inch LCD screen	7 inch LCD screen	7 inch LCD screen	7 inch LCD screen
Heating temperature	Room temperature-200.0C	Room temperature-200.0C	Room temperature-200.0C	Room temperature-200.0C
Isostatic pressure	300MPa	300MPa	300MPa	500MPa
Isostatic chamber size	Φ30×150mm(M×N)	Φ40×150mm(M×N)	Φ×50×150 (M×N)	Φ×50×150 (M×N)
Piston stroke (T)	50mm	50mm	50mm	50mm

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