

Solenoid Valves Market Forecasts to 2030 – Global Analysis By Valve Type (2-Way Solenoid Valves, 3-Way Solenoid Valves, 4-Way Solenoid Valves and 5-Way Solenoid Valves), Operation Type, Material Type, Size, Usage, End User and By Geography

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Abstracts

According to Statistics MRC, the Global Solenoid Valves Market is accounted for \$5.01 billion in 2024 and is expected to reach \$6.48 billion by 2030 growing at a CAGR of 4.4% during the forecast period. A solenoid valve is an electromechanically operated device that controls the flow of liquids or gases. It consists of a solenoid (coil) that, when energized, generates a magnetic field to move a plunger, opening or closing the valve. These valves are widely used in automation, fluid control, and industrial processes across industries like oil & gas, chemical, water treatment, and automotive. Their precise control, reliability, and rapid response make them essential in various applications.

According to METI (Japan), the crude steel production is projected to rise slightly by 0.3% y-o-y compared to the same period of last year, reaching 21.63 million tonnes (mnt) for the July-September quarter.

Market Dynamics:

Driver:

Increasing automation across industries

The surge in industrial automation is a key driver propelling the market. As industries across the globe adopt automated systems to enhance efficiency, productivity, and

precision, the demand for solenoid valves has risen sharply. These valves are integral components in automated control systems, providing reliable and accurate regulation of fluid and gas flow. Industries such as manufacturing, pharmaceuticals, and food processing are increasingly utilizing solenoid valves to achieve seamless operations and reduce human intervention. The integration of solenoid valves with advanced technologies like IoT and AI has further enhanced their functionality, enabling real-time monitoring and predictive maintenance, optimizing operational performance while minimizing downtime and maintenance costs.

Restraint:

Sensitivity to fluid contamination and temperature

One of the key challenges in the solenoid valve market is the susceptibility of these valves to operational failures, particularly in harsh industrial environments. Solenoid valves rely on electromagnetic coils to function, making them vulnerable to overheating, voltage fluctuations, and coil degradation. External factors such as dirt, debris, and moisture infiltration can lead to clogging, corrosion, or leakage, affecting their performance and lifespan. Additionally, solenoid valves are sensitive to pressure variations and temperature extremes, which can result in reduced efficiency or complete failure in demanding applications.

Opportunity:

Development of miniaturized solenoid valves

One of the key opportunities lies in the integration of solenoid valves with smart technologies such as IoT and AI. This integration enables real-time monitoring, predictive maintenance, and enhanced operational efficiency, making solenoid valves more attractive to industries seeking to optimize their processes and reduce downtime. Additionally, the growing emphasis on energy efficiency and sustainability is creating a demand for innovative solenoid valve designs that minimize energy consumption and support eco-friendly operations. The expanding applications of solenoid valves in emerging sectors such as energy, electric vehicles, and smart water management systems also offer lucrative growth prospects.

Threat:

Increasing raw material prices

The solenoid valves are highly dependent on the availability of raw materials making them susceptible to supply chain disruptions and price volatility. Fluctuations in the cost of raw materials due to geopolitical tensions, trade restrictions, or economic instability can impact production costs and profit margins. Additionally, the reliance on specific regions for material sourcing and manufacturing, particularly in Asia, creates risks related to trade policies and tariffs. These uncertainties force manufacturers to either absorb higher costs or pass them on to consumers, affecting demand and potentially slowing market growth.

Covid-19 Impact:

The COVID-19 pandemic has had a notable impact on the solenoid valve market. Initial disruptions in supply chains and manufacturing activities caused temporary setbacks in market growth. The solenoid valve market suffered losses in the early months due to lower end-user demand, particularly in the food and automotive industries. Government-mandated closures of non-essential businesses reduced operating hours, while automotive production and sales declined significantly in 2020. Additionally, reduced crude oil demand and prices negatively impacted the market, as solenoid valves are widely used in the oil and gas industry.

The direct-acting valves segment is expected to be the largest during the forecast period

The direct-acting valves segment is expected to account for the largest market share during the forecast period due to their simple design and versatility. These valves are widely used in medical equipment, including over 2.1 million dialysis machines and ventilators manufactured globally in 2023. Their ability to operate without pressure differentials makes them essential in low-pressure systems, such as lab equipment, where over 1.5 million units required precise fluid control. In addition, direct-acting valves are integral to the automotive sector, using these valves for fuel injection systems. The growth of direct-acting valves is closely tied to industrial automation trends.

The stainless steel segment is expected to have the highest CAGR during the forecast period

Over the forecast period, the stainless steel segment is predicted to witness the highest growth rate due to its superior corrosion resistance and durability in harsh

environments. Stainless steel solenoid valves are increasingly preferred in industries requiring high purity and sanitary conditions, such as pharmaceuticals, food processing, and chemical manufacturing. The material's ability to withstand aggressive chemicals, high temperatures, and pressure makes it ideal for demanding applications. Growing regulatory requirements for food safety and pharmaceutical production are driving adoption, while the expansion of water treatment facilities worldwide further boosts demand. Manufacturers are investing in advanced stainless steel valve designs with improved efficiency and longer service life, contributing to the segment's accelerated growth.

Region with largest share:

During the forecast period, the North America region is expected to hold the largest market share owing to the region's strong industrial foundation and significant infrastructure expenditures. The presence of major suppliers and manufacturers has fostered a competitive environment that promotes innovation and new product development. Key industries significantly depend on solenoid valves for effective fluid and gas management. The growing emphasis on automation in manufacturing and other sectors has increased demand for solenoid valves that improve operational efficiency and reliability. Additionally, the region's regulatory frameworks and focus on sustainability and energy efficiency have accelerated the adoption of advanced solenoid valves.

Region with highest CAGR:

Over the forecast period, the Asia Pacific region is anticipated to exhibit the highest CAGR driven by expanding industrialization, urbanization, and infrastructural developments in countries like China, India, Japan, and South Korea. Significant investments in manufacturing, automotive, oil and gas, and water treatment sectors are fueling product demand. The region's power generation sector is undergoing massive expansion, with countries like Vietnam projecting 10-12% annual growth in power consumption through 2030. Additionally, the region is witnessing a significant shift towards valve automation and digital technologies in industrial processes, which is further boosting the growth.

Key players in the market

Some of the key players in Solenoid Valves Market include Emerson Electric Co., Parker Hannifin Corporation, Danfoss A/S, Burkert Fluid Control Systems, SMC

Corporation, Curtiss-Wright Corporation, GEMU Group, IMI plc, Festo SE & Co. KG, Airtac International Group, The Lee Company, Rotork plc, KITZ Corporation, Takasago Electric, Inc., ODE S.r.l. and Valtorc International.

Key Developments:

In April 2024, Emerson has introduced the new ASCO™ Series 148/149 safety valve and motorized actuator designed for industrial fuel oil burner recirculation and safety shutoff applications. The new solution provides a reliable, versatile tool for industrial users to prevent overpressure, leaks, and system malfunctions that can lead to health and safety incidents, with one configuration suited to a wide range of combustion system applications.

In November 2023, Emerson has introduced the new ASCO™ Series 327C solenoid valve, which features a direct-acting, high-flow design that provides superior flow-to-power ratio compared to similar valves. The Series 327C design features a balanced poppet construction that permits high flows at minimum power levels, making it ideal for use in power plants, refineries and chemical processing facilities.

In November 2022, Parker Hannifin, the global leader in motion and control technologies, is announcing a set of next-generation pre-compensated load sensing (LS) valves, as part of the VA Series, designed specifically for highly demanding mobile machinery applications. The market-leading performance of the VA Series mobile directional control valves ensures outstanding maneuverability and robustness, as well as allowing greater flexibility and modularity. These valves are designed and prepared to meet future demands within a range of challenging industries, such as forestry, construction, mining and material handling.

Valve Types Covered:

2-Way Solenoid Valves

3-Way Solenoid Valves

4-Way Solenoid Valves

5-Way Solenoid Valves

Operation Types Covered:

Direct-Acting

Pilot-Operated

Semi-Direct Acting

Material Types Covered:

Stainless Steel

Brass

Aluminum

Plastic

Sizes Covered:

Micro-Miniature

Sub-Miniature

Miniature

Small Diaphragm

Large Diaphragm

Usages Covered:

Pneumatic

Hydraulic

Fluidic

End Users Covered:

Oil & Gas

Chemical & Petrochemical

Water & Wastewater

Food & Beverage

Power Generation

Pharmaceutical & Healthcare

Automotive

Agriculture

Transportation Systems

Other End Users

Regions Covered:

North America

US

Canada

Mexico

Europe

Germany

UK

Italy

France

Spain

Rest of Europe

Asia Pacific

Japan

China

India

Australia

New Zealand

South Korea

Rest of Asia Pacific

South America

Argentina

Brazil

Chile

Rest of South America

Middle East & Africa

Saudi Arabia

UAE

Qatar

South Africa

Rest of Middle East & Africa

What our report offers:

- Market share assessments for the regional and country-level segments
- Strategic recommendations for the new entrants
- Covers Market data for the years 2022, 2023, 2024, 2026, and 2030
- Market Trends (Drivers, Constraints, Opportunities, Threats, Challenges, Investment Opportunities, and recommendations)
- Strategic recommendations in key business segments based on the market estimations
- Competitive landscaping mapping the key common trends
- Company profiling with detailed strategies, financials, and recent developments
- Supply chain trends mapping the latest technological advancements

Free Customization Offerings:

All the customers of this report will be entitled to receive one of the following free customization options:

Company Profiling

Comprehensive profiling of additional market players (up to 3)

SWOT Analysis of key players (up to 3)

Regional Segmentation

Market estimations, Forecasts and CAGR of any prominent country as per the client's interest (Note: Depends on feasibility check)

Competitive Benchmarking

Benchmarking of key players based on product portfolio, geographical presence, and strategic alliances

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