AN EXECUTIVE WHITE PAPER ON:

THE U.S. MARKET FOR PRESSURE SWITCHES

A STRATEGIC RESOURCE FOR SENIOR MANAGERS WHO WANT TO MAXIMIZE GROWTH AND PROFITABILITY

Prepared by:

Tim Shea
Industry Analyst

Venture Development Corporation

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TECHNOLOGY MARKET RESEARCHERS AND STRATEGISTS SINCE 1971

One Apple Hill Drive, Ste. Box 8190, Natick Massachusetts 01760-9904 U.S.A.
Phone: 508.653.9000 ♦ Fax: 508.653.9836 ♦ Email: info@vdc-corp.com
www.vdc-corp.com

MARKET SIZE, SEGMENTATIONS AND FORECASTS

In 2001, the total U.S. consumption of pressure switches totaled $359 million. The adverse effects of the September 11th tragedies on the U.S. economy, combined with the impact of the continued trend away from pressure switches (toward pressure transducers), has led VDC to forecast only a 0.2% CAGR over the next five years. In 2006, VDC forecasts that total U.S. consumption of pressure switches will reach almost $363 million. Growth in solid-state pressure switches is expected to be quite robust. However, these devices will only account for 4% of the overall pressure switch market in 2006.

By Type of Pressure Measurement

VDC forecasts average market growth rates in all but one of the four functional types of pressure measurement. The ranking of dollar shipments in 2001 by type of pressure measurement are:

1. Gauge
2. Absolute
3. Differential
4. Vacuum

By Pressure Ranges

- The vast majority of pressure switches were designed for pressures of 1000 psi or less. Pressure switches designed for pressures under 1000 psi are generally found in high volume applications such as HVAC systems, automotive, and home appliances.
- Pressure ranges above 500 psi, accounted for only 19% of U.S. consumption in 2001. These typically involve specialized applications often found in the military/aerospace segment, in some chemical & petrochemical applications, and in some large hydraulic systems.

By Sensing Technologies

VDC forecasts flat to declining growth for all of the electromechanical type pressure switches, with the exception of piston and "other" types (i.e., combination piston/diaphragm and snap-action Belleville disk spring). The ranking of dollar shipments in 2001 by type of sensing technologies are:

1. Diaphragm
2. Other types (piston/diaphragm, Belleville spring, etc.)
3. Piston
4. Bellows
5. Solid-state
6. Bourdon tube

Reasons for robust growth expectations for solid-state pressure switches include:

- Longer cycle life—they routinely have an operational life of 100 million cycles;
- They provide greater accuracy and possess high resistance to shock and vibration;
- Full-range adjustment (0-100%) of set point and dead band;

- Provide the ability to handle a wide range of system pressures and long-term stability;
- Offer a broad frequency response;
- A good alternative to electromechanical types when the cycle rate exceeds 50 cycles/minute;
- In addition to opening or closing the pressure switch circuits, they provide a proportional 4-20 mA analog signal or digital output; the analog signal can interface with PLCs, DCSs, and computers, a facet important in factory automation;
- Many solid-state pressure switches have a built-in keypad and display that simplify setup, especially when operating conditions and control parameters routinely change.

Adjustability

- Pressure switches with field-adjustable set points accounted for the slight majority of consumption in the U.S. in 2001.
- Adjustable units are used extensively in military/aerospace applications, in the chemical & petrochemical industry, and in certain home appliance applications such as for washing machines with low, medium, and high water settings.

Standard, Modified Standard, and Custom Devices

- Standard pressure switches are, and are expected to remain, the most demanded type of device during the next five years.
- Non-standard aspects oftentimes include the pressure sensing elements, the housings, switch mechanisms, and switch contact elements. The military/aerospace market segment generally demands customized product due to its specialized performance and reliability specifications.

By Type of Enclosure

- The large majority of pressure switches were shipped with some sort of enclosure. About one in six were shipped in open frames with no housing. These are generally sold to OEMs who design their own specialized housing or mount the switch inside equipment.

By Type of Sales Organization

- The bulk of pressure switch sales are made by a vendor's company sales force. Manufacturers' representatives make up the remaining sales.
- Sales made via the Internet or through company EDI systems are expected to increase over the forecast period. Customers are seeking ways to lower their transaction costs and vendors are trying to reduce costs so as to remain price competitive.

By Customer Classes

- The majority of pressure switches sales were made directly to OEMs/SIs. Many of these OEMs are found in the high volume markets such as HVAC systems, automotive, and home appliances.
- VDC did not see any significant changes in sales by the class of customers. VDC estimates that the size of the MRO market for pressure switches comprises about 35% of the total market in 2001.

By Consuming Industries

The major application segments are likely to be adversely impacted in the near term by the tragic events of September 11, 2001. VDC expects that the stimulus package being put forth to the Congress, and which is expected to be enacted, will begin to have a positive impact on the overall U.S. economy sometime during the 2nd or 3rd quarter of 2002.

The ranking of pressure switch dollar shipments in 2001 by consuming industries are:

1. HVAC
2. Military/Aerospace
3. Automotive
4. Home Appliances
5. Chemical & Petrochemical
6. Other: Process
7. Pumps & Compressors
8. Heavy Vehicles
9. Other: Non-Process
10. Machine Tools
11. Utilities
12. Food Processing
13. Medical Equipment
14. Manufacturing Machinery

VENDOR ANALYSIS

Chapter IX provides detailed profiles of the leading vendors.

Overall Market

Twenty-five companies account for the overwhelming majority of domestic consumption of pressure switches. Texas Instruments, the industry leader, had almost twice as much market share as its next closest competitor, ITT Neo-Dyn. Johnson Controls and United Electric are tied for 3rd place.

Other noteworthy players include: SOR, Honeywell, Custom Control Sensors, Barksdale, Eaton, Fasco, Siemens, Square D, MPL, Invensys Appliance Controls, and Invensys Climate Controls.

Type of Pressure Measurement

Absolute—In 2000, the four largest vendors of absolute type pressure switches were:

1. Texas Instruments
2. Johnson Controls
3. Fasco
4. Invensys Appliance Controls

Differential—In 2000, the top four players of differential pressure switches were:

1. Honeywell
2. Siemens
3. Custom Control Sensors
4. Dwyer Instruments

Gauge—There is no one company that clearly dominates this fragmented market. ITT Neo-Dyn and United Electric were the only two major competitors in 2000.

Vacuum—This is a relatively small market with few vendors competing. There was no clear dominant player. In 2000, the top five players were:

1. Invensys Climate Controls
2. ITT Neo-Dyn
3. Square D
4. Fulton Bellows
5. Texas Instruments

Type of Sensing Technology

Bellows—Johnson Controls was the clear leader in shipments of bellows technology in 2000. Ranco was its next closest competitor.

Bourdon Tube—Dwyer Instruments and Barksdale are the only two major players offering Bourdon tube type pressure switches.

Diaphragm—This technology is employed by a large number of companies and it is sold into a broad range of applications. Texas Instruments is the dominant player in the market. Other leading players in 2000 were:

2. Honeywell
3. Siemens
4. Fasco
5. Invensys Appliance Controls
6. MPL
7. Square D

Piston—Invensys Climate Controls and Barksdale were the only two dominant players in this market. Other noteworthy players included United Electric, Dresser Industries, and Eaton.

Other—Some vendors utilize a combination piston/diaphragm sensing technology and others use a snap-action Belleville disk spring technology. ITT Neo-Dyn utilizes its Nega-Rate® Belleville spring pressure switches and has the commanding lead in the "other" category. SOR relies on a combination piston/diaphragm sensing technology. Custom Control Sensors is another leading supplier of the non-patented Belleville spring pressure switch.

Solid-State—United Electric holds the dominant position in the small, but rapidly growing, solid-state pressure switch market. United Electric has almost four times the market share of its next two closest competitors, SOR and MPL.

REPORT AVAILABILITY

The Venture Development Report titled "**The U.S. Market for Pressure Switches"**, is available for purchase. This comprehensive 125+ page report may be purchased for $4,950.

STUDY SOURCE

Venture Development Corporation, a technology market research and strategy firm, was founded in 1971. Over the years, VDC has developed and fine-tuned a unique and highly successful methodology for forecasting and analyzing highly dynamic technology markets. VDC has extensive experience in providing multi-client and proprietary analysis in the industrial automation market. VDC also offers in-depth market research and custom strategic planning consulting services in the areas of industrial measurement and control, factory automation, communications, Auto ID, electronic components, as well as embedded computing.

For further information regarding "**The U.S. Market for Pressure Switches**", or other VDC reports or services, contact Tim Shea, Industry Analyst, or Marc Regberg, Vice President at:

Venture Development Corporation
One Apple Hill Drive, Ste. Box 8190, Natick, Massachusetts, 01760
Tel: 508.653.9000 ♦ Fax: 508.653.9836 ♦ E-mail: info@vdc-corp.com
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