

INDUSTRIAL APPLICATIONS

Application Note

Sensors and Switches in Sanitary Valves

BACKGROUND

Sanitary and food and beverage valves are engineered for pressure control in sanitary (or “clean”) environments. They are usually manufactured with stainless steel for sanitary and high-purity applications.

These valves are often constructed as a ball valve around a full-bore design that ensures the product passes through the valve with no restrictions on the flow with minimal pressure drop. (See Figure 1.)

Figure 1. Sanitary Valve



Sanitary and food and beverage valves are often found in pharmaceutical, biotechnology, food and beverage, cosmetics, chemical and other industries where sanitary process control is required for steam, gases, and liquids such as water-for-injection systems. (See Figures 2, 3, 4, 5, 6.)

Figure 2. Pharmaceutical



Figure 3. Biotechnology



Figure 4. Food and Beverage



Figure 5. Cosmetics



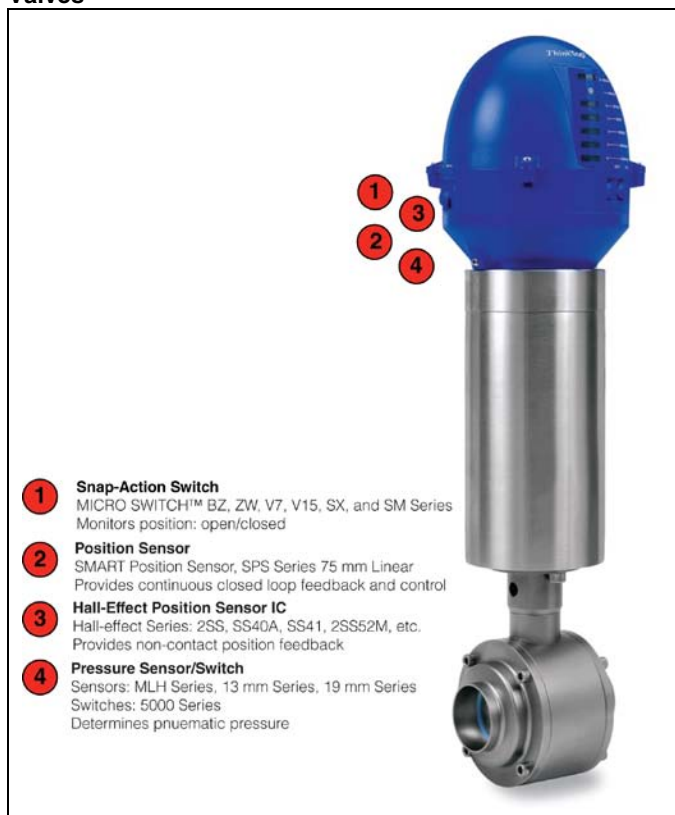
Figure 6. Chemical



SOLUTIONS

Honeywell’s wide range of sensors and switches offers accurate position control, reduction in overall system and set-up costs, durability, and enhanced reliability. (See Figure 7.) Solutions include:

Figure 7. Potential Honeywell Products Used in Sanitary Valves



- **MICRO SWITCH™ Snap-Action Switches** (See Table 1.)
- **Position Sensors and Hall-Effect Position Sensor ICs** (See Table 2.)
- **Stainless Steel Media Isolated Pressure Sensors** (See Table 3.)
- **Pressure Switch** (See Table 4.)

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Table 1. MICRO SWITCH™ Snap-Action Switches









MICRO SWITCH™ BZ Series	MICRO SWITCH™ ZW Series	MICRO SWITCH™ V7 Series	MICRO SWITCH™ V15 Series	MICRO SWITCH™ SX Series	MICRO SWITCH™ SM Series
					
Features and Benefits					
<ul style="list-style-type: none"> Accepted global standard "Large Basic" switch Low operating force/differential travel Extended life up to 20,000,000 cycles at 95% survival Elongated mounting hole for accurate, easy mounting Current rating from 15 A to 25 A Choice of actuation, termination and operating characteristics High temperature versions (204 °C [400 °F]) Momentary or maintained actions Capable of an IP67 rating 	<ul style="list-style-type: none"> Small, light weight, low cost, ample electrical capacity, extended life Choice of low energy or power duty electrical ratings (gold-plated or silver contacts) Single pole double throw (SPDT) circuitry or single pole single throw (SPST) circuitry available Choice of ratings, actuation, termination and operating characteristics PBT polyester housing material IP67 sealed available 	<ul style="list-style-type: none"> Premium portfolio for wide range of electrical loads, best suited for higher cost-of-failure applications Designed for 100 K operations at full load or 10M for mechanical life Global package size acceptance Current rating from 0.1 A to 25 A UL/CSA recognized, ENEC (European) approval available Choice of actuation, termination and operating characteristics 	<ul style="list-style-type: none"> Standard portfolio best suited for lower cost-of-failure applications Designed for 50K operations at full load or 5M for mechanical life Current ratings 5 A to 26 A Global approvals (UL/CSA, cUL, ENEC, and CQC) Limited configuration options available 	<ul style="list-style-type: none"> Extended life Elongated mounting hole for easy, accurate mounting Choice of actuation, electrical termination, operating characteristics MIL-PFR-8805 qualified listings available Lower operating force provides for enhanced operation and application versatility Enhanced precision and repeatability Covered case construction with molded-in terminals allows for very simple adaptation to the customers' actuation systems 	<ul style="list-style-type: none"> Extended life Elongated mounting hole for easy, accurate mounting Choice of actuation, electrical termination, operating characteristics (sensitive differential travel 0,0254 mm [0.001 in] max., low operating force to 0,56 N [2.0 oz.] max.) MIL-PFR-8805 qualified listings Small size, light weight, ample electrical capacity, precision operation, extended life High precision and repeatability Options: gold contacts for low energy switching, bifurcated gold contacts for max. reliability, power load switching to 11 A

Table 2. Position Sensors

SMART Position Sensor SPS Series, 75 mm Linear Configuration	Hall-Effect Magnetic Position Sensor ICs SS351AT/SS451A, SS361CT/SS461C, SS361RT/SS461R, SS400/SS500 Series, SS41/ SS51T, SS421, SS42R, SS46, VF526DT, 91SS, SS490/SS491B, SS49E/SS59ET, SS94
	
Features and Benefits	
<ul style="list-style-type: none"> Flexible, durable package for specified harsh environments Reduces costs, increases standardization by 90%, eliminating multiple sensor and switch components Patented combination of magnetoresistive and ASIC provides accuracy up to 0.05% of full-scale On-board ASIC provides signal processing and communication with customers' integrated control units Simple non-contact solution reduces wear and tear 	<ul style="list-style-type: none"> Small package size (SOT-23 subminiature, flat TO-92-style) allows for use in compact designs with tight space limitations High magnetic sensitivity allows for the use of small, low-cost magnetics and for a wider gap between the sensor and the magnet than devices with a lower magnetic sensitivity Standard output simplifies installation and is easy to interface with common electronic control circuits, simplifying installation Wide operating frequency (most operate over 1 kHz) for precise tracking of a fast-moving magnet Wide operating temperature accommodates a variety of environmental conditions Solid state, non-contact technology enhances system reliability Repeatable magnetic characteristics for accurate position monitoring

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Table 3. Stainless Steel Media Isolated Pressure Sensors




MLH Series	13 mm Series	19 mm Series
		
Features and Benefits		
<ul style="list-style-type: none"> • Small package with high integration reduces the number of components needed to implement the sensor • Wide pressure range, including capability up to 8000 psi (MLH Series: 0 psi to 50 psi through 9 psi to 8000 psi; 13 mm Series: 0 psi to 500 psi through 9 psi to 5000 psi; 19 mm Series: 0 psi to 3 psi through 9 psi to 500 psi) allows for varied use within the application • Enhanced accuracy (MLH Series: $\pm 0.25\%$ BFSL, $\pm 0.5\%$ BFSL below 100 psi; 13 mm Series and 19 mm Series: ± 0.25 BFSL max.) allows for accurate pressure measurement of the media, enhancing reliability of the calculated flow rate • Allows the user to monitor pressure within the specified range and adjust as needed, enhancing flow rate efficacy • Wetted materials or media isolated packaging enhances resistance to contaminants or media, offering compatibility with many harsh environments • Customization that includes various pressure ranges, package styles (ports and connections), and calibrated options minimizes design-in effort • Products are available throughout the customer's product lifecycle, eliminating restarting the design-in process, and requalifying or resubmitting for regulatory approval 		

Table 4. Pressure Switches

5000 Series	Features and Benefits
	<ul style="list-style-type: none"> • Long life (2 million cycles or more) provide enhanced reliability, lower warranty costs, fewer service calls, long life, less corrosion and equipment uptime • Switch repeatability offers best-in-class accuracy and set-point integrity • Environmentally sealed electrical connectors • Mechanical: external hex fitting, various pressure ports • Electrical: various integral connectors available • MICRO SWITCH™ capabilities provide improved performance specifications • Standard mechanical and electrical connections reduce tooling costs • Easy, rapid assembly lowers production costs and provides a faster cycle time

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WARNING

PERSONAL INJURY

DO NOT USE these products as safety or emergency stop devices or in any other application where failure of the product could result in personal injury.

Failure to comply with these instructions could result in death or serious injury.

WARRANTY/REMEDY

Honeywell warrants goods of its manufacture as being free of defective materials and faulty workmanship. Honeywell's standard product warranty applies unless agreed to otherwise by Honeywell in writing; please refer to your order acknowledgement or consult your local sales office for specific warranty details. If warranted goods are returned to Honeywell during the period of coverage, Honeywell will repair or replace, at its option, without charge those items it finds defective. **The foregoing is buyer's sole remedy and is in lieu of all other warranties, expressed or implied, including those of merchantability and fitness for a particular purpose. In no event shall Honeywell be liable for consequential, special, or indirect damages.**

While we provide application assistance personally, through our literature and the Honeywell web site, it is up to the customer to determine the suitability of the product in the application.

Specifications may change without notice. The information we supply is believed to be accurate and reliable as of this printing. However, we assume no responsibility for its use.

WARNING

MISUSE OF DOCUMENTATION

- The information presented in this application note is for reference only. Do not use this document as a product installation guide.
- Complete installation, operation, and maintenance information is provided in the instructions supplied with each product.

Failure to comply with these instructions could result in death or serious injury.

SALES AND SERVICE

Honeywell serves its customers through a worldwide network of sales offices, representatives and distributors. For application assistance, current specifications, pricing or name of the nearest Authorized Distributor, contact your local sales office or:

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