

Watertight Switches in Transportation Applications

An Application Note

Background

Honeywell's MICRO SWITCH watertight basic switches can be used in a wide variety of wash-down applications, including trucks, buses, forklifts, lawn mowers, ATVs, and golf carts. The V15W, ZD and ZW series switches are designed specifically for these challenging indoor or outdoor applications. Rugged yet precise, they accurately control the machine and are rated to meet IP67 ratings for water and dust protection (switch body only). Reliability, accuracy, and flexible design options make Honeywell V15W, ZD and ZW basic watertight switches suitable for electrical absence/detection in these challenging applications.

For design engineering flexibility, the MICRO SWITCH V15W, ZD, and ZW series of basic switches feature a variety of actuators, terminations, wire connections, operating and electrical characteristics to solve applications. From subminiature to miniature switches, select the series that's right for your application.

Solutions

Brake lights, auxiliary controls, reverse alarms, position detection for forklift trucks and operator presence detection switches all require extra protection in wet and dusty environments.

- Brake light switches – Position sensing behind brake pedal to turn on brake lights
- Auxiliary controls and alarms – Continuous position status with enhanced reliability and accuracy
- Forklift position detection – Position sensing on the forks for safe operation
- Operator presence detection switches – Presence sensing for operator presence in the driver's seat for safety

In other types of transportation applications, watertight switches may be found on handle-bar controls for ATVs, recreational vehicles, personal watercraft (wave runners) and snowmobiles; provide window control and seat belt detection; and deliver hood, door, and trunk latch detection.

Figure 1. Transportation Application



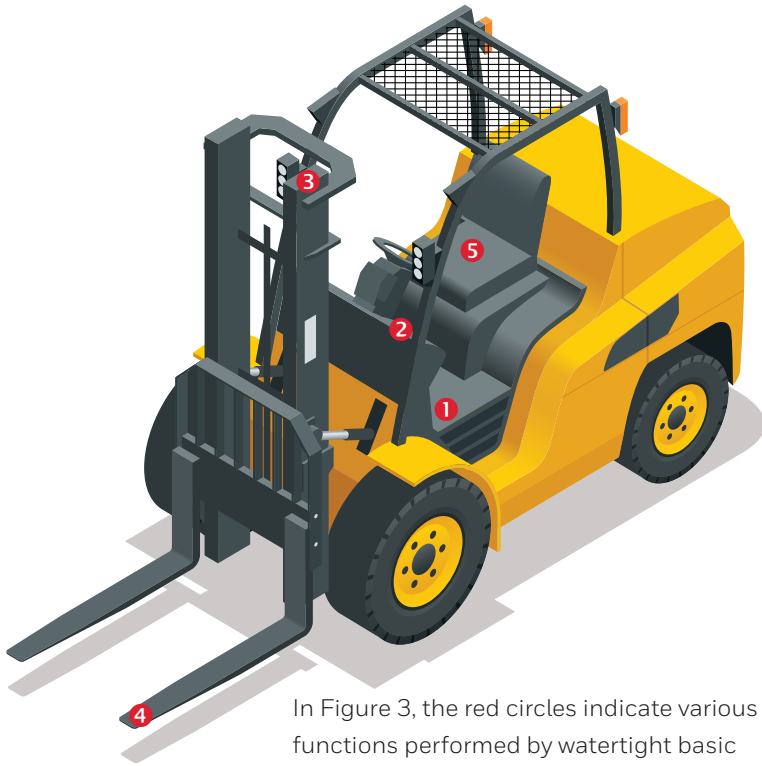
Watertight basic switches serve a variety of purposes in transportation applications, including presence/absence, switch stops, and position status.

In Figure 2, the watertight basic switch serves as a reverse alarm that sounds when lever is moved to "reverse" setting.

Figure 2. Watertight Basic Switches in Golf Cart Applications



Figure 3. Watertight Basic Switches in Fork Lift Applications



In Figure 3, the red circles indicate various functions performed by watertight basic switches.

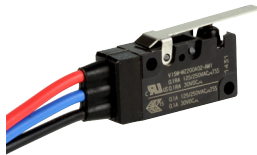
- 1 Foot brake switch – Activates brake light
- 2 Hand lever switch – Activates brake light
- 3 Fork lift mast – Travel limit switch stops vertical travel of the forks
- 4 Fork lift tilt – Travel limit switch stops tilt travel of the forks
- 5 Operator presence – Detects presence of driver, and provides shut-down protection

Honeywell MICRO SWITCH watertight basic switches offer global approvals (UL, cUL, ENEC, and CQC) and IP67 sealing for use in environments where exposure to liquid ingress or particulate contaminant could occur. However, there are differences among these series to consider for various transportation applications.

V15W Series – The largest of the Honeywell watertight switch offerings, this V-sized switch is rated up to 10 A, as well as an operating force range of 15 g to 200 g. Silicone rubber plunger seal and epoxy resin assure the V15W Series delivers high sealing capability.

ZD Series – The smallest of the Honeywell watertight switch offerings, the ZD Series has either a 0.1 A or 3 A rating and SPDT circuitry and features an integral sealed pin plunger. The switch package is designed to accommodate demanding temperature requirements, up to 85°C [185°F].

ZW Series – Available with SPDT, SPNO, and SPNC circuitry options, the ZW Series has a low operating force of 1.94 oz to 7.16 oz. This Series has a more narrow operating temperature than the other two Series: -25°C to 70°C [-13°F to 158°F] and features an integral sealed pin plunger.



Learn more about the V15W Watertight Basic Switches



Click here to view ZD Watertight Basic Switches



Click here to view ZW Watertight Basic Switches

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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.

WARNING **MISUSE OF DOCUMENTATION**

- The information presented in this product sheet 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.