

# SOLID WASTE MANAGEMENT AND DISPOSAL

Application Note

## Considerations and recommended products for solid waste management and disposal.

### BACKGROUND

Every year, an estimated 1.3 billion tons of solid waste is generated around the world. According to the World Bank, solid waste is expected to increase to 2.2 billion tons by 2025. Environmentally sound waste management is one of the key elements for sustainable global development. The three main entities that play a major role in the management and handling of solid waste include:

- Equipment and machines such as garbage trucks, refuse containers, dump trucks, compactors, balers, conveyor systems, etc.
- Workers who operate equipment and oversee the entire process from collecting to disposing
- Facilities where solid waste is collected and sorted for recycling or further processing, such as for the production of energy and methane gas

As would be expected, waste handling is a dirty business, so these entities must be able to perform in harsh, temperature-varying environments with high levels of shock, force and vibration. Solid waste also has the potential to be hazardous and must be handled and disposed of properly to avoid contamination or bodily injury.

### RECOMMENDED PRODUCTS

#### MICRO SWITCH Heavy-Duty Limit Switch

For superior performance in industrial applications, Honeywell snap-action switches are sealed in rugged housings and tested to withstand repeated use.

#### MICRO SWITCH Compact Precision Limit Switch

Designed for a wide variety of indoor and outdoor applications, the E6/V6 family of switches incorporates the Honeywell MICRO SWITCH BZ switch element which has the reliable snap-spring mechanism with more than 60 years of proven service.

#### MICRO SWITCH Cable-Pull Safety Switch

Part of Honeywell's broad portfolio of safety switch solutions, cable-pull switches provide safety stop capabilities and perform consistently even in varying temperatures.

**Honeywell**



## APPLICATIONS

### Refuse Trucks

Refuse trucks have an opening at the rear where the waste collector throws the garbage bags or empties the garbage bins. An articulated blade gathers the refuse deposited at the rear opening and pulls it inside. These vehicles have compactors on board that compress the solid waste into compact pieces, which is then pushed into the loading hopper inside the truck. In some refuse trucks, the solid waste in the loading hopper is further compressed against the side walls.

In this application, an industrial limit switch can be positioned to monitor and control the safe travel of the blade. The NO/NC contacts of the switch can be wired to the refuse truck's control system so if there is an unsafe or over-travel of the blade, the switch will actuate and break the power circuit of the blade.

For refuse trucks that use a mechanical arm, a limit switch can be used to prevent over-travel. A second limit switch can be positioned in the grasping lever to measure and control the amount of force being applied to the garbage bins to avoid damage.



### Waste Compactor

In the waste compactor, the refuse is fed via a chute into a chamber. When a certain pre-determined level is reached, a hydraulically actuated or mechanically actuated metal plate applies force to the material in the downward or horizontal direction. The operator then disengages the hydraulic compression and opens the collection compartment door to take out the heavily compacted solid waste.

Heavy-duty or compact-precision industrial limit switches can be installed at proper locations in the compactor to stop the downward plate. If the electrical-hydraulic system malfunctions or if a mechanically actuated system exerts more than the recommended compression force, the limit switch will trigger and cut off power to the compactor power circuit.



### Conveyor

Waste management facilities have conveyor systems for recycling and waste separation and distribution. There are workers operating these conveyor systems as part of their daily jobs as well as another group of workers who perform service and maintenance activities on the equipment. Regulatory organizations such as the Occupational Safety and Health Administration (OSHA) require safety mechanisms to be in place for industrial conveyor systems so if for some reason there is an issue such as a system malfunction or a worker's clothing getting stuck, he/she can pull a cable-pull safety switch to stop the conveyor.



### **MICRO SWITCH Heavy-Duty Limit Switch**

- Three series offer rugged, die-cast body and epoxy coating
- Sealed to NEMA 1, 3, 4, 4X, 6, 6P, 12, 13 and NEMA IP65/66/67
- Type 316 case stainless steel body available
- Multiple mounting and actuator options
- Boss-and-socket head design for secure head-to-body retention
- All-metal drive train
- UL, CSA, CE, UKCA, CCC approvals



### **MICRO SWITCH E6/V6 Limit Switch**

- Zinc housing with electrostatic-applied epoxy coating provides enhanced durability
- Sealed actuator versions available for wet or particulate environments
- MICRO SWITCH BZ basic switch element provides increased repeatability
- Precision switching of electrical and mechanical operating characteristics
- Wide variety of actuator options, circuitries, connection and mounting options
- UL, CSA, CE, UKCA approvals



### **MICRO SWITCH Cable-Pull Safety Switch**

- Models available for both short and long conveyor systems
- Multiple contact configurations available
- Bright, multi-cluster high-intensity LED status indicator light
- Large wiring cavity with straight-through wiring
- Electrostatic, epoxy-coated, die-cast zinc housing
- UL, CSA, CE, UKCA, SIL approvals



### **⚠ WARNING IMPROPER INSTALLATION**

- Consult with local safety agencies and their requirements when designing a machine control link, interface and all control elements that affect safety.
- Strictly adhere to all installation instructions.

**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 during the applicable warranty period. 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 that Honeywell, in its sole discretion, 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 Honeywell may provide information or engineering support for its products through Honeywell personnel, literature and website, it is the buyer's sole responsibility to determine the suitability of the Honeywell product(s) for the buyer's requirements.

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

### **For more information**

Honeywell Sensing Solutions services its customers through a worldwide network of sales offices and distributors. For application assistance, current specifications, pricing, or the nearest Authorized Distributor, visit [automation.honeywell.com/hss](http://automation.honeywell.com/hss) or call:

USA/Canada	+302 613 4491
Latin America	+1 305 805 8188
Europe	+44 1344 238258
Japan	+81 (0) 3-6730-7152
Singapore	+65 6355 2828
Greater China	+86 4006396841

### **Honeywell Sensing Solutions**

830 East Arapaho Road  
Richardson, TX 75081  
[honeywell.com](http://honeywell.com)