

## Protecting people

Operator safety should always be considered when installing limit switches. These devices are designed for mechanical activation in automatic control. Prevent accidental activation due to operator error by installing a shield to protect the switch. Also, use a non-overriding cam or dog to activate the switch.



## Cost-saving strategies

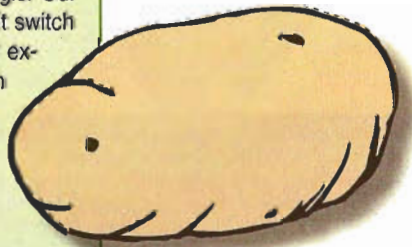
The best cost-saving strategy is to select a switch that meets the physical demands of the application. Choose an actuator type with the right shape and material in order to minimize wear and reduce maintenance. Design in the switch so that no more than 70% of the overtravel rating is used. This can be accomplished by designing the cam or dog to eliminate snap-back or excessive overtravel on the switch's actuator.

## Standards and regulations

Limit switches fall under the category of auxiliary devices for industrial control equipment in the Underwriters Laboratories UL508 certification process. Shorthand created by UL designates a rating code that represents the control circuit load that may be controlled by the device that combines continuous current, maximum current for make and break at various voltages, and maximum volt-amps. Standard duty switches begin with codes B and P; heavy-duty switches begin with codes A and N. The voltage rating at 50 and 60 Hz follows the prefix.

## Spud switch

Misapplication of a limit switch can range from merely frustrating to tragic. Our engineers once received a call about repeated premature failures of a limit switch installed as part of a food-handling conveyor. The maintenance engineer explained that he had potatoes pouring continuously past the limit switch's thin wire actuator and into a hopper below. This pounding avalanche exceeded the switch's overtravel rating, causing failures just about every month. A design modification prevented the limit switch and actuator from direct potato contact and provided a link to a more robust actuator type, thereby eliminating the problem.



## Safety ratings

In North America, most designers are familiar with both Underwriters Laboratories (UL) and Canadian Standards Association (CSA). However, as more machine builders do business in China, limit switches are now starting to show the CCC ratings as well.

### Standards for conventional limit switches

Agency	Standard
UL	UL508
CSA	CSA C22.2 No. 14
CCC (CQC)	GB14048.5

### Standards with requirements for direct opening safety limit switches

Agency	Standard
IEN	IEC 60947-5-1
TÜV Rheinland	EN60947-5-
UL	UL508
CSA	C22.2 No. 14
BIA	GS-ET-15
SUVA	SUVA
CQC (CCCs)	GB14048.5

Limit switches are subject to Europe's Reduction of Hazardous Substances (RoHS) regulations and each manufacturer must provide compliance information. California and other states have recently enacted similar regulations. Limit switches used on machines built for Europe and some Latin American countries must be RoHS compliant.

For more information, visit [www.omron.com](http://www.omron.com).