

Actuators for Low-Energy Operators



From the well-known blog idighardware.com, Lori Greene brings some much-needed clarity to codes.



Photo credit: ©iStockphoto.com/HawksnestEdinburgh

BY LORI GREENE, AHC/CDC, CCPR, FDHI

FROM A CODES AND STANDARDS PERSPECTIVE, THERE ARE THREE BASIC types of automatic operators for swinging doors: power-assist, low-energy power-operated, and power-operated (also known as full-power-operated).

- Power-assist operators reduce the opening force so the door can be manually opened more easily, but they do not completely open the door without force applied manually. These operators are usually activated by pushing or pulling the door, although occasionally a wall-mounted actuator is used to reduce the force only for users who need that feature.
- Low-energy operators are often used when the door will be opened manually by some users and automatically by others. The doors are subject to limitations on opening speed and force to limit the generation of kinetic energy and the potential for injury, and they must be operated by a “knowing act.” Because of these limits, most doors with low-energy operators are not required to have safety sensors, control mats, or guide rails.
- Full-power operators are typically found on high-use openings like the entrance to a grocery store or department store. They are not subject to the same restrictions on speed and force, and they require safety sensors or control mats and guide rails to prevent the doors from opening if someone is in the path of the door swing.

ANSI/BHMA A156.19, *Power Assist & Low Energy Power Operated Doors*, is the standard that applies to power-assist and low-energy operators; ANSI/BHMA A156.10, *Standard for Power Operated Pedestrian Doors*, covers full-power operators. Both of these standards are referenced by the *International Building Code* and other publications, so most of the detailed requirements are found in these standards rather than within the codes, but as referenced standards, the requirements effectively become part of the code.

The 2007 edition of ANSI/BHMA A156.19 introduced a requirement for power-assist and low-energy power-operated doors to be activated by a “knowing act.” The knowing act method may be a push plate actuator or non-contact switch mounted on the wall or jamb, the act of manually pushing or pulling a door, or an access control device like a card reader, keypad, or keyswitch.

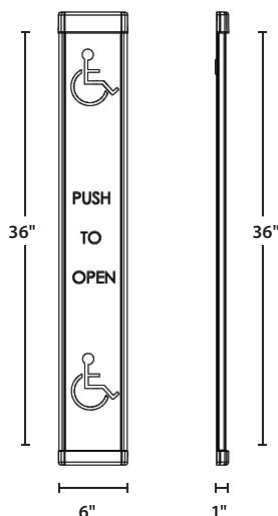
Photo Courtesy of Lori Greene, Ingersoll Rand Security Technologies

The standard also makes recommendations regarding the mounting location of a knowing act switch, including the following. Preferably, the switch should be:

- Mounted within one to five feet from the door but not more than 12 feet
- Accessible from the swing side when the door is open
- Not in a location where the user would be in the path of the moving door
- Mounted so the user can see the door when activating the switch
- At an installation height of 34 inches minimum and 48 inches maximum above the floor

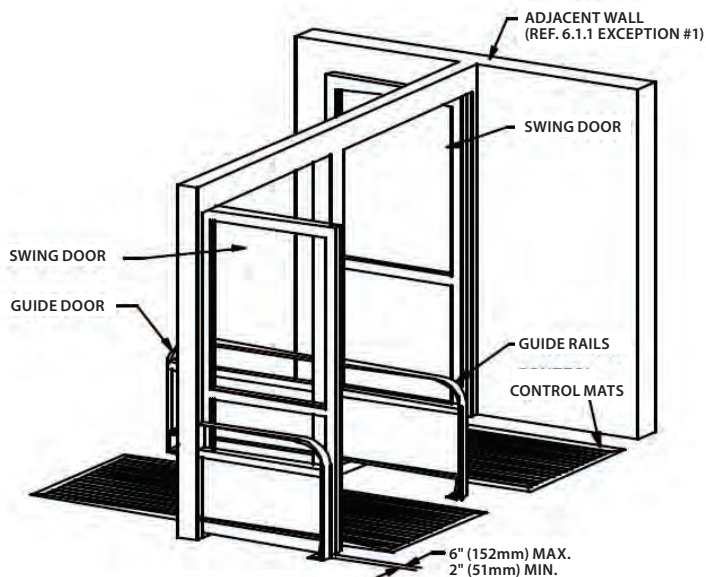
The 2010 *ADA Standards for Accessible Design*, and ICC A117.1, *Accessible and Usable Buildings and Facilities*, also contain requirements pertaining to the actuators for automatic doors. Clear floor space for a wheelchair must be provided adjacent to the actuator and beyond the arc of the door swing. The mounting height is variable, depending on the reach range associated with the location of the switch, but the range recommended by the ANSI/BHMA standards is acceptable for most applications. Actuators must not require tight grasping, pinching, or twisting of the wrist to operate, and the operating force is limited to five pounds maximum.

Stepping into the field of a motion sensor is not considered a knowing act. If automatic operation via a motion sensor is desired, automatic doors must comply with the standard for full-power operators: ANSI/BHMA A156.10, instead of A156.19. This means that even though the door may have a low-energy or power-assist operator, it has to meet the same requirements as a full-power operator, including the safety sensors or control mats and guide rails.




Guide rails are required on the swing side of each door and are typically 30 inches high. For some locations, the need for guide rails may mean that motion sensor operation is not feasible. If certain criteria are met, walls may be used in place of guide rails. When doors are installed across a corridor, guide rails are not required if the distance between the wall and the door in the 90-degree open position does not exceed 10 inches.

The 2010 *California Building Code* requires two push plate actuators at each actuator location: one mounted between seven and eight inches from the floor to the centerline, and the other mounted between 30 and 44 inches above the floor. Vertical actuation bars may be used in lieu of two separate actuators, with the bottom of the bar at five inches maximum above the floor, and the top at 35 inches minimum above the floor. Actuators must be in a conspicuous location, with a level and clear ground space outside of the door swing. The minimum size for push plates is four inches, and the minimum operable portion for vertical actuation bars is two inches wide. Both types of actuators must display the International Symbol of Accessibility.



From the 2011 edition of ANSI/BHMA A156.10, a swing door equipped with guide rails and control mats

While all of these requirements have the same basic intent, it's best to check your state and local code requirements to see which standard has been adopted and what the specifics are in reference to actuators for automatic operators. Verify the actuator type/quantity, location, and any additional requirements. And keep in mind that additional safety features, including sensors and guide rails, may be required for low-energy operators actuated by a motion sensor. 

About the Author: Lori Greene, AHC/CDC, CCPR, FDHI is the Manager of Codes and Resources for Ingersoll Rand Security Technologies. She can be reached at lori_greene@irco.com or online at iDigHardware.com.