

Everything You've Always Wanted to Know About Door Closers

by: Vince Butler

Door closers - if you'll pardon the pun - literally go over most people's heads. They are usually installed at the top of doors and door frames, out of the line of sight, unnoticed. Most door closers are purposely designed to match the door and frame so that they don't attract attention.

These modern designs are a relatively recent innovation. Once upon a time, closers performed a solely functional duty through their potbelly design. These old-style closers bear a striking resemblance to an old pot belly stove and look nearly as incongruous when attached to a door. Sturdy and reliable, these closers are frequently spotted in older buildings, still functioning decades after installation.

Tradition says that the door closer was invented in 1877 when the rector of Boston's Trinity Church lost patience with a slamming door interrupting services. A parishioner repurposed an old water pump to control the door, and the rest is closer history.

Currently, door closers are required not for silence, but by fire code. NFPA 80 - Standard for Fire Doors and Other Opening Protectives requires that fire doors be self-closing and self-latching to contain and control the flames and smoke. Because fire and water from sprinklers or fire hoses tend to ruin electronic equipment, positive closing and latching must be accomplished by mechanical means, i.e., a door closer.

Positive latching is a fire code requirement for commercial buildings, but residences have one area where it is required as well - the door between a house and an attached garage. Because few people relish the thought of a closer in their home, positive latching is typically accomplished with the use of spring hinges. These hinges have a spring installed in them that will swing a door shut and allow positive latching.

Spring hinges can be tricky to adjust, though, with a tendency to break if over-tightened. Nor do they truly control a door through the entire opening and closing cycle, so they are not generally encouraged in commercial applications.

Another situation in which a door closer could be required is an installation in a very windy area. High-speed wind can grab a door and wrench it open, destroying the hinges, the door, the door frame, even the wall behind the door. A strong door closer with a built-in stop in the closer arm or a separate overhead stop can resist the wind and protect the hinges, frame, and surrounding surfaces. Many closer manufacturers provide installation plates and templates that allow concurrent installation of an overhead stop with a door closer. These are recommended in high wind or high traffic openings.

Today's door closers are not only functional but add aesthetic value to myriad commercial applications. Closer bodies have been redesigned to be sleeker and take up less space on the surface of the door or frame. They are meant to be inconspicuous, matching the style of their wood or metal environment. Covers are available in a variety of painted and plated finishes to meet decors ranging from rustic to modern. Modern closers also have several more features than the original potbelly closers. These options provide more control over the entire opening and closing cycle, for example - delayed action, latching



Door closer mounted with coordinator

speed control, and backcheck control.

There is no longer a "one size fits all" philosophy to closer function, either. Heavy doors or high traffic openings will require heavy duty closers. Heavy duty surface mount closers made of cast iron or aluminum alloy are ideal for any high foot traffic door application over a wide range of temperatures. This includes entry doors, bathroom doors, or almost any door in commercial applications, including schools, medical facilities, office buildings, and hospitality.

Concealed closers are also available, which allow almost "invisible" control over the door; special templates are cut into the door and frame where the closer body will be installed, and only the arm of the closer is visible extending from the door to the frame. Concealed closers have similar features as standard closers and are an excellent choice for some projects.

It can also be important to provide adjustability

in closers. This might feel counterintuitive - the door hasn't changed, why would the closer need to change? The main reason may sound a little obvious - the closer has stopped closing the door. This typically isn't a situation where closer settings have changed over time, but rather that the building environment has changed.

The primary culprit when a closer suddenly stops swinging and latching a door is the HVAC system in the building. For example, winter has arrived, the heat is running almost constantly, and now there is higher pressure in the building that the door closer can no longer overcome. Adjustments to the spring power and hydraulics in the closer will allow it to perform its function properly again.



Parallel Arm Mount

Another situation where closers need to be adjusted is for the American with Disabilities Act (ADA) requirements. The ADA was written into law in 1990, prohibiting discrimination against individuals with disabilities; the law not only covers equal employment and services but access to buildings as well. Door hardware is held to strict guidelines to ensure it doesn't present a barrier to access. For example, thresholds must be less than a one-half inch tall, and hallways and doorways must be at least 32 inches wide to allow wheelchair access. Door closers must allow for the minimum effort to meet ADA requirement of five pounds to open a door.

Adjustable closers have internal springs, modifiable via external ports that allow adjustment in the pressure required to open a door. The ADA also requires the closing speed of a door to be adjusted so that from a 90-degree open position, the time required for the door to close is a 12-degree open position be no less than five seconds, to give individuals with mobility issues time to make their way through the door. Latching and sweep speed ports are typically standard on door closers; backcheck and delayed action options are often available, too.

Door closers need to walk a fine line between ADA requirements and fire codes. NFPA 80 does not address the amount of force required to open a door, but it does require

positive latching and specifies the sizes of closers appropriate for different size openings. In general, accomplishing positive latching takes precedence over the "fire pounds of force" rule, although it can seem like every installation is different. For final authority on openings, it may be necessary to seek out the local authority having jurisdiction over the project.

Closer adjustments are accomplished through the passage of fluid through chambers of the piston, and as such, great care must be taken to measure the fluid to exacting standards while staking the external ports to limit their movement and ensure leak-free performance. If the closer is going to be installed in extreme heat or cold, it is also important to consider that its hydraulic fluid is rated for the anticipated ambient temperature.

The basic commercial grade closer has a standard arm that can be mounted in either a regular or parallel fashion. The difference between the arms is determined by the mounting position of the closer on the door. If the closer is on the push side of a door, it requires parallel arm mounting. Regular arm mounting is used on the pull side of a door. It is also possible to install the closer as a "top jamb mount" - the closer body is attached to the frame of the door, and the regular arm mount is attached to the push side of the door. Closer arms can be specified with varying characteristics such as heavy-duty, hold-open, cushion stop, etc., available to prolong the life of the closer and enhance the user experience based on the environment and application specifics.

Depending on tastes and installation needs, an alternate method of door control is an overhead holder/stop. These devices are fluid-free, and while not offering the adjustable back check of a closer, they typically provide varying degrees of compression before dead stop. They can be surface or concealed mounted and may offer stop or stop and hold open functions.

It is important to note that an overhead stop with a hold-open function is not appropriate for a fire door, as it would interfere with positive latching in case of emergency. Electromagnetic door holders are available, which can be tied to the fire alarm system and will release the door if the alarm goes off. As specified by the architect or preferred by the end user, overhead holders and stops may also be used in conjunction with a closer - such as in high wind areas, as we mentioned earlier.

Door closers and overhead holder/stops are two options that provide cost-effective methods of commercial door control. The primary purpose for closers is quite straightforward - to close the door, whether required by building code, aesthetics, or user preference. However, the means by which this is accomplished can be as varied and diverse as there are types of buildings. We hope that the often-concealed world of door closers has been made a little clearer through this article.

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