

Back-to-basics: Lock functions

When a hardware consultant writes a specification, it's common practice to sit down and discuss the project with the architect, at least for the more complicated jobs.

The topic of lock functions seems to arise at almost all of those meetings—usually someone in the room needs a refresher on how the basic functions work. In fact, when I was teaching our spec writer apprentices a few weeks ago I said, “Don't ask the architect if he or she wants a storeroom function lock, ask if the door should always require a key to enter.” A manufacturer's catalog may show 50 different lock functions (or more!) and it's difficult or impossible to remember how each function works.

Luckily, there are 6 mechanical lock functions that account for the vast majority of locks specified. Add in a few deadbolt functions, and a basic understanding of electromechanical locks, and you've got the most common lock functions mastered! If a project requires a different lock function, our spec writers can help you decide which one to use. The most common functions for mechanical locks are described below. Please note that all of these functions allow free egress at all times.

Passage sets are used where doors do not need to lock. There is no key cylinder and no means to lock a passage set.

Privacy sets are used for restrooms or dressing rooms. They can be locked from the inside with a thumbturn or push button/turn for privacy, and they are typically unlocked from the outside using a tool rather than a key. There are several variations on this function, including a hospital privacy which has a thumbturn on both the inside and outside to allow hospital staff quick access to the bathroom. Some privacy functions may also incorporate an indicator to show the locked/unlocked status of the lock.

Storeroom locks are used when the outside lever should be locked at all times. A key is used to retract the latchbolt and open the door; when the key is removed the door is locked on the outside. There is no means to lock/unlock the door from the inside. Typical locations for a storeroom lock would be secure storage rooms, mechanical rooms, and electrical rooms that do not require panic hardware. When a storeroom lock is specified, a door closer may also be needed to ensure that the door is not left open, defeating security.



F01

Passage latch

Latch bolt operated by lever from either side at all times.



F22

Privacy, bedroom or bath lock

Latch bolt operated by lever from either side except when outside lever is locked by inside turn or button. Operating inside lever, closing door or operating outside emergency release unlocks outside lever.



F07

Storeroom lock

Latchbolt retracted by key outside or by knob/lever inside. Outside knob/lever is always inoperative. Auxiliary latch deadlocks latchbolt when door is closed. Inside lever is always free for immediate egress.



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Office locks may be controlled by a key in the outside cylinder, or by a thumbturn or push button/turn on the inside. The outside lever may be left in a locked or unlocked position. And the use of the thumbturn/button provides convenience to the user, but may also allowed an unauthorized person to control the lock. This lock should be used where unauthorized use of the lock is not a concern—perhaps an individual office, or storage closet that does not need to be secured at all times.

Classroom locks are controlled by a key in the outside cylinder, which locks or unlocks the outside lever. The lock can be left in the locked or unlocked state by using the key, and there is no means of locking or unlocking the door from the inside. This function was originally designed for schools, to prevent students from tampering with the lock, but most new schools have classroom security locks, office function locks or electrified locks. A classroom lock might be used for a common office corridor or suite entry, where key control of the lock is needed, and a thumbturn or push button/turn is not desired.

Classroom security locks allow control of the outside lever via key cylinders on both the inside and outside of the door. This allows a teacher to lock the classroom door during a lockdown event without opening the door and possibly being exposed to an intruder in the corridor. In some jurisdictions these locks are required by law for school classrooms. The cylinder on the classroom side of the door does not prevent egress—it controls the outside lever, and is typically keyed so that all of the inside cylinders on classroom doors are operated by the same key, or are operated by any key in the school's key system ("maison keying"). Classroom security locks are not restricted to classrooms, and can be used in any location where key-control of the outside lever is required from the inside of the room.

Deadbolts

Some doors may require the added security of a deadbolt, either combined in a mortise lock with one of the functions above, or as a separate lock. If a door is part of a means of egress, it must unlatch with one operation (with some exceptions for residential dwelling units), so deadbolts are often installed on doors with push/pull hardware. One example would be a door to a restroom with multiple toilet stalls, where the door would typically be push/pull (no latch) but may need to be locked if there is a plumbing problem.

Most deadbolts have a cylinder on the outside to project or retract the bolt. On the inside, there may be a thumbturn or key cylinder. If the door is in a means of egress (including the means of egress from a restroom), an occupant must be able to unlatch the door without a key, tool, or special knowledge or effort, so the applications for a key cylinder on the egress side are very limited. A thumbturn on the inside may freely project and retract the deadbolt, or in the case of a classroom function deadbolt the thumbturn will retract the deadbolt but not project it. A classroom function deadbolt prevents an unauthorized person from projecting the deadbolt to secure a room without permission, but provides for safe egress by allowing the thumbturn to retract the deadbolt if an occupant is accidentally locked inside the room by someone projecting the bolt with a key. This function is often used for the door leading to a multi-stall restroom.



F04

Entry lock

Latch bolt operated by lever from either side except when outside lever is made inoperative by a stop or mechanical means other than key. When outside lever is locked, latch bolt is retracted by key from outside or by operating inside lever. Auxiliary dead latch.



F05

Classroom lock

Latch bolt operated by lever from either side except when outside lever or knob is locked from outside by key. When outside lever is locked, latch bolt is retracted by key, or by operating key and outside lever from outside or by operating inside lever.



F32

Classroom security lock (Intruder latch bolt lock)

Latch bolt operated by lever from either side except when outside lever is locked from inside or outside by key. When outside lever is locked, latch bolt is retracted by key from inside or outside or by operating inside lever.



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Electrified locksets

There are various types of electrified products that can be used as part of an access control system. But electrified lock functions for mortise or cylindrical locks are actually fairly simple. There are two functions that are most commonly used—either electrically locked (fail-safe) or electrically unlocked (fail-secure). The examples below use Schlage® L Series mortise lock functions to illustrate:

An electrified lock is set up so it can be controlled by a card reader, remote release, or other access control device to minimize key use. The electrically unlocked or fail-secure L9092EU mortise lockset is locked on the secure side when there is no power to the lock. To unlock it, power is applied and the lever can then be turned to retract the latch. The latch remains projected until the lever is turned.

Conversely, L9092EL is a fail-safe electrified mortise lockset that is locked when power is applied. When power is removed, the lever can be turned to retract the latch. Fail-safe electromechanical locks are typically used when entry from the access side of the door is required during a fire (example: stairwell doors providing re-entry). The lock is constantly powered so the lever on the stair side is locked. During a fire alarm, the lever on the stair side is unlocked (power removed) either by the fire alarm or a signal from the fire command center, depending on which code has been adopted. Building occupants may then leave the stair to find another exit if necessary. The stair doors would also be unlocked during a power failure. Both L9092EL and L9092EU allow free egress from the non-secure side at all times.



L9092EL

Electrically Locked (Fail Safe)

Outside knob/lever continuously locked by 12 or 24V DC. Latchbolt retracted by key outside or by knob/lever inside. Switch release or power failure allows outside knob/lever to retract latchbolt. Auxiliary latch deadlocks latchbolt when door is closed. Inside knob/lever always free for immediate exit.



L9092EU

Electrically Unlocked (Fail Secure)

Outside knob/lever continuously locked. Latchbolt retracted by key outside, by knob/lever inside or by knob/lever outside when 12 or 24V DC power is applied. Switch or power failure locks outside knob/lever. Auxiliary latch deadlocks latchbolt when door is closed. Inside knob/lever always free for immediate exit.

Conclusion

For questions about any of these lock functions, assistance with special applications, or a complete specification, Allegion™ has more than 100 specification writers and architectural consultants available to help. We are also an AIA/CES approved provider, and conduct a wide range of courses offering AIA continuing education units. For help with code-compliance and product application, visit www.idighardware.com, where you can find articles, videos, online trainings and the [Allegion Code Reference Guide](#).

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