

Back-2-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 specwriter 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.



L9010

Passage Latch

Latchbolt retracted by knob/lever from either side at all times. Inside lever is always free for immediate egress.



L9040

Bath/Bedroom Privacy Lock

Latchbolt retracted by knob/lever from either side unless outside is locked by inside thumbturn. Turning inside knob/lever or closing door unlocks outside knob/lever. To unlock from outside remove emergency button, insert emergency thumbturn (furnished) in access hole and rotate. Inside lever is always free for immediate egress.



L9080

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.

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 (see below). 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 her classroom door during a lockdown event without opening the door and possibly being exposed to an intruder in the corridor, and [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.



L9050

Office and Inner Entry Lock

Latchbolt retracted by knob/lever from either side unless outside is made inoperative by key outside or by turning inside thumbturn. When outside is locked, latchbolt is retracted by key outside or by knob/lever inside. Outside knob/lever remains locked until thumbturn is returned to vertical or unlocked by key. Auxiliary latch deadlocks latchbolt when door is closed. Inside lever is always free for immediate egress.



L9070

Classroom Lock

Latchbolt retracted by knob/lever from either side unless outside is locked by key. Unlocked from outside by key. Inside knob/lever always free for immediate exit. Auxiliary latch deadlocks latchbolt when door is closed. Inside lever is always free for immediate egress.



L9071

Classroom Security Lock

Latchbolt retracted by knob/lever from either side unless outside is locked by key from either side. When locked, latchbolt retracted by key outside or knob/lever inside. Auxiliary latch deadlocks latchbolt when door is locked. Inside lever is always free for immediate egress.

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). I'll use the Schlage L9000 mortise lock functions to illustrate:

L9080EL is a function that is [electrically locked \(EL\), or fail-safe](#). When electricity is applied to the lock, the outside lever is locked (inside lever always allows free egress). When electricity is removed from the lock, the outside lever is unlocked. The locking of the outside lever can also be controlled by a key that retracts the latch momentarily, but with an access control system it's best to limit the use of keys. A fail-safe electrified lock is typically used when entry from the access side of the door is required during a fire; a stairwell door would be equipped with a fail-safe electrified lock to meet the [stairwell reentry requirements](#). The outside lever of a fail-safe lock will be unlocked during a power failure or fire alarm, which impacts security.

L9080EU is a function that is electrically unlocked (EU), or fail-secure. When electricity is applied to the lock, the outside lever is unlocked (inside lever always allows free egress). When electricity is removed from the lock, the outside lever is locked. The locking of the outside lever can also be controlled by a key that retracts the latch momentarily (again, should be limited for maximum control of the system). Fail-secure electrified locks are more common than fail-safe locks, as they provide security even when no power is applied. Most codes do not require the lever on the access side (outside) of the door to be unlocked during a fire alarm or power failure.

Conclusion

For questions about any of these lock functions, assistance with special applications, or a complete specification, [Ingersoll Rand Security Technologies](#) 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 ask a specific question using the Help button.

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L9080EL

Electrically Locked (Fail Safe)

Outside knob/lever continuously locked by 24V AC or DC. Latchbolt retracted by key outside or by knob/lever inside. Switch 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.



L9080EU

Electrically Unlocked (Fail Secure)

Outside knob/lever unlocked by 24V AC or DC. Latchbolt retracted by key outside or knob/lever inside. Auxiliary latch deadlocks latchbolt when door is closed. Inside knob/lever always free for immediate exit.