

ABLOY® MASTER KEY SYSTEM DESIGN GUIDE



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ABLOY Locking Security

Locking security is a matter of great importance to all of us. It is made up of a number of elements, such as design, products, stampings, programming, locking system data maintenance, after-care and service as well as handling of the keys and key blanks.

A careful design of master keying forms the basis of key control. The more expertise is used for master keying design, the easier will be key control, the use of the keys, and the minimisation of security risks.

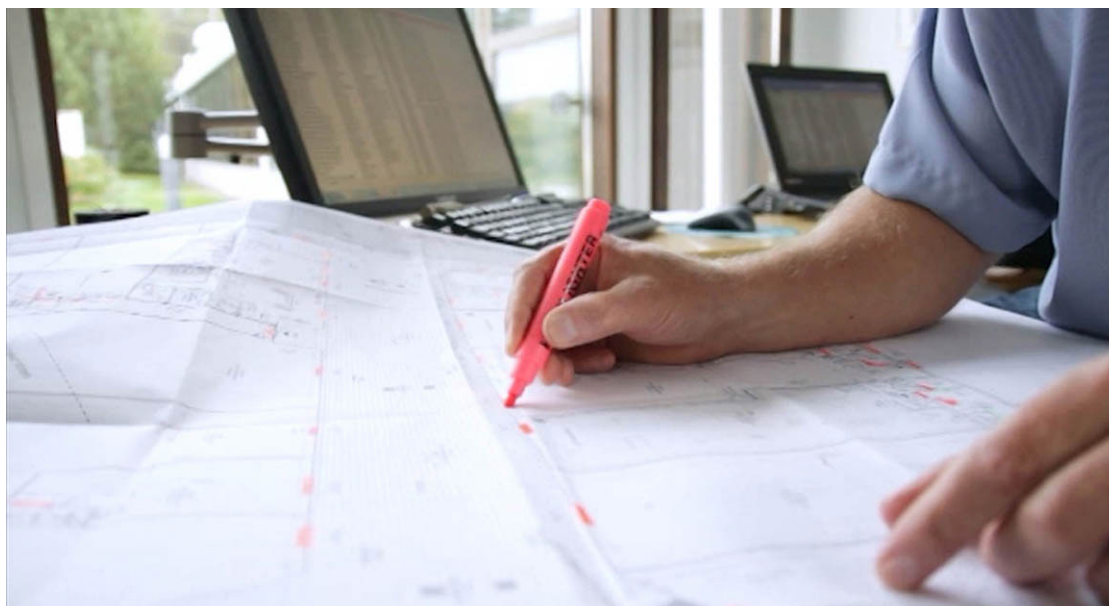
To ensure an organisation has the desired level of security, it is necessary to have a properly designed and maintained master key system. Abloy Oy offers wide range of cylinder systems, products and services to help you implement a new master key system, or extend an existing one.

Professional Support

The local ABLOY representative will help you design a secure master key system, develop and implement key control policies, select the right product for different applications, and understand the latest trends and future demands in physical security.

Master Key System Design Guide

The general guide lines of planning ABLOY locking system are explained in this guide.

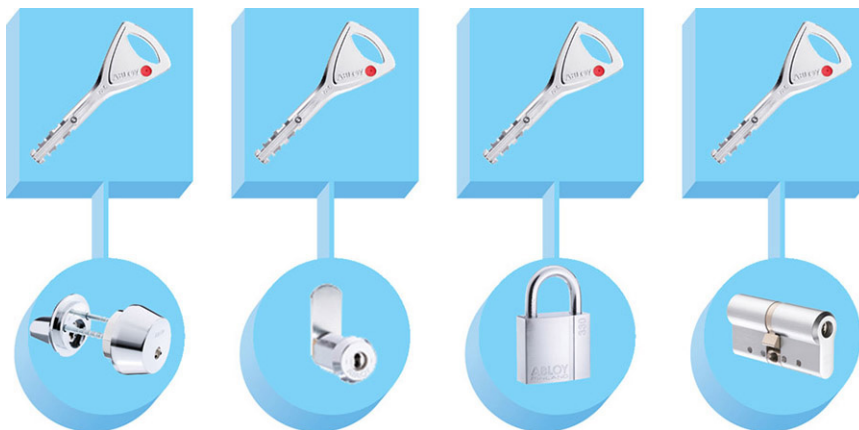


ABLOY BASIC TERMINOLOGY - KEYINGS

Keyed To Differ, abb. KD:

Locks or cylinders, each of which is combined differently from the others. Each different key operates only one lock or cylinder. They may be a part of a master key system if the system is designed so. But they can not be added into a master key system later on without rekeying.

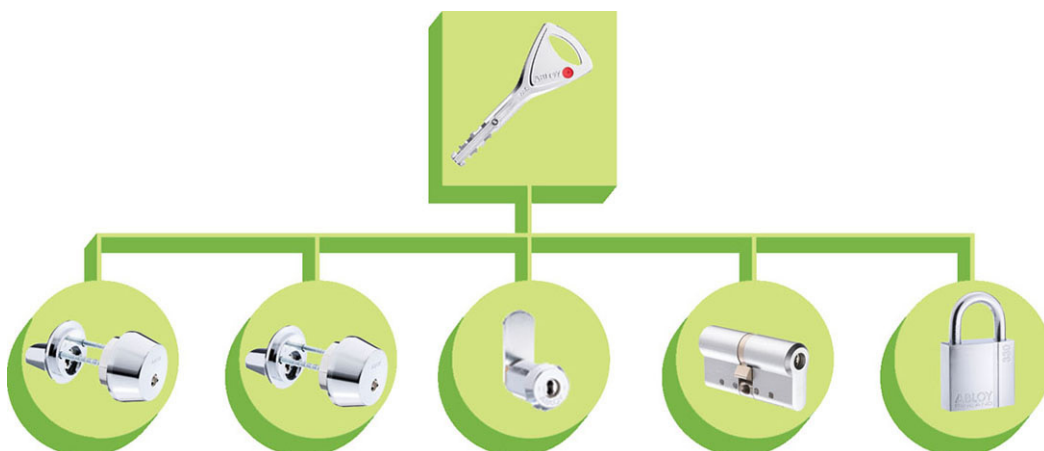
When they are not designed to be part of a master key system, the codes are so called random codes and they are not allowed to be master keyed.



Keyed Alike, abb. KA:

Two or more locks or cylinders which have the same key combination. Number of locks can be operated by the same key. They may be a part of a master key system if the system is designed so. But they can not be added into a master key system later on without rekeying.

When they are not designed to be part of a master key system, the codes are so called random codes and they are not allowed to be master keyed.

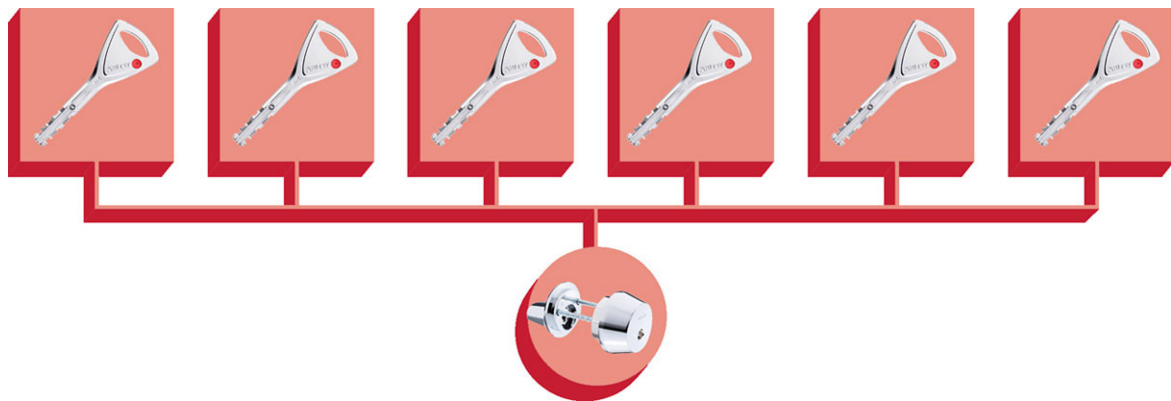


ABLOY BASIC TERMINOLOGY - KEYINGS

Central Locking:

Central key system, also called maison or common key system. A keying system in which one or more cylinders are opened by every key or by large number of different keys in the system. For example a lock or cylinder of a gate or main entrance door.

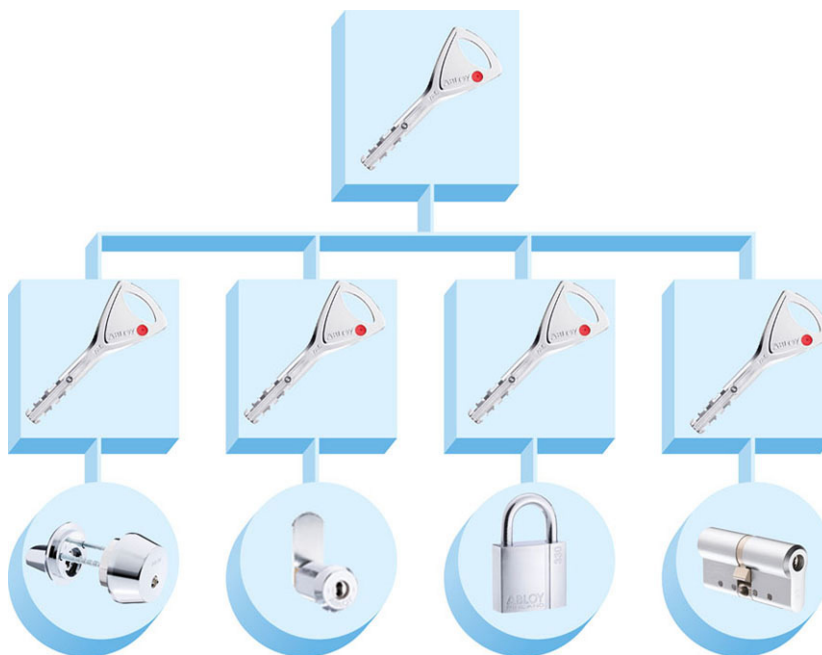
The openings for central locks should be created group by group. No individual key of its own for the central lock.



Master Keying, abb. MK

2-Level System

The simplest master key system has two levels of keying and is considered the basic level of master keying. The less powerful keys at the bottom are called individual keys. Each individual key operates only one lock, or one group of keyed alike locks. The more powerful key at the top is called the master key.

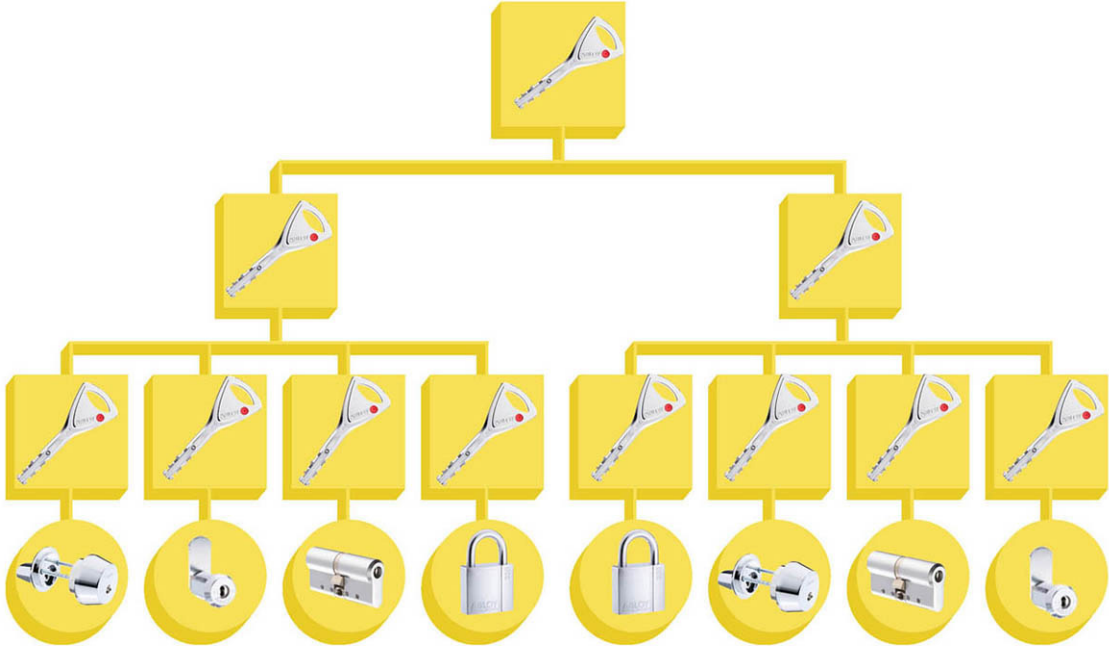


ABLOY BASIC TERMINOLOGY - KEYINGS

Grand Master Keying, abb. GMK

3-Level System

A 3-level system is two or more 2-level systems tied together under a higher level key called a grand master key.

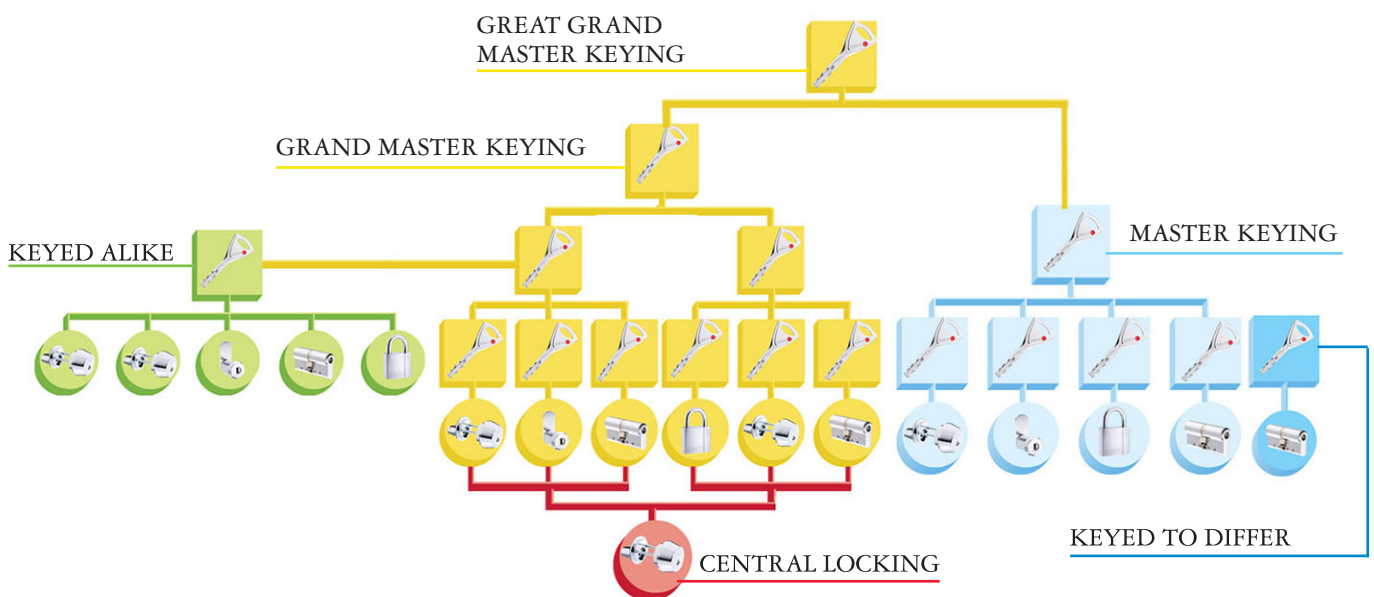


ABLOY BASIC TERMINOLOGY - KEYINGS

Great Grand Master Keying, abb. GGMK

4-Level System

A 4-level system ties two or more 3-level systems together under a higher level key called a great grand master key. Even though large systems tend to require more levels of keying than small ones, most systems do not need more than 4 levels of keying.



Cross Keying

Cross keying a cylinder allows additional keys other than its own key set to operate it.

- Should be avoided.
- Does not fit in a system that has been designed for a high security.
- Reduces the overall system capabilities.

ABLOY BASIC TERMINOLOGY - KEYS

Individual Key

An individual key of a certain lock or cylinder.

Master Key

A key which operates all the master keyed locks or cylinders in a group, e.g. within an area, floor or department. Each lock or cylinder is also operated by its own individual key in straight 2-levels MK systems. Should not be in daily use and must be stored safely.

Grand Master Key

The key which operates two or more separate groups of locks, which are each operated by a different master key. Should not be in daily use and must be stored safely.

Great Grand Master Key

The key which operates two or more separate groups of locks, which are each operated by a different grand master key. Should not be in daily use and must be stored safely.

Independent Master Key

A master key which does not have any individual keys related to its combination. It can be made to operate any specific lock or cylinder in the entire system in addition to the regular master keys and individual keys.

It is operating within the whole system, within several sections or groups. E.g. a maintenance key or a cleaner key is a typical independent master key.

The quantity of independent master keys is limited within a system and it is affected e.g. by:

- cylinder system
- key profile
- the number of other keys and how they operate the locks.



ABLOY KEY SECURITY LEVELS

Key security is one of the most important success factors to maintain the security level of the locking system on the desired level. Availability of additional keys is decided in the key security policy of an organisation.

In ABLOY locking system, you can decide whether you need local service for additional keys, or if you want highly restricted procedures for that.

ABLOY locking systems are always manufactured according to your specification as we offer different key security levels to allow only a certain type of procedures for additional keys.

ABLOY Key Security Level 4

Changes, extensions and key service is extremely strictly controlled, thus they are available from Abloy Joensuu factory only. Or according to agreement between Abloy Oy and the locking system owner.



ABLOY Key Security Level 3

Changes, extensions and key service is available either from Abloy Oy Joensuu factory or the ABLOY sales office/authorised importer.



ABLOY Key Security Level 2

Changes, extensions and key service is available locally offered by ABLOY authorised service centers.



ABLOY Key Security Level 1

A basic level of keying, recommended for KD locking only.

PLANNING

Careful planning is a base to the long-term success of master key system. When designing a master key system, always consider possible future extensions. Planning starts with understanding the operation of the organisation. From there, it is easy to move onto developing the key system structure.

The simplest keying systems are often the most secure and will last longer than complicated ones. Cross keying, independent master keys, central locks and complicated systems may reduce security and extension possibilities.

System Structure

Begin sketching out a key system schematic using descriptive terms appropriate for the job at hand. Typically these would be buildings, departments or geographic areas. It is not necessary to account for every individual key at this early stage. The schematic often looks like an organisational chart.

When planning a system for a building, do not forget the building core. Core areas are generally maintenance areas such as mechanical rooms, electrical centers, phone and data areas. Normally, floor or department masters **do not** operate these areas. Group them all under their own master key or use individual keys under the grand master key. Key all similar core areas alike. This reduces the need to issue master keys to maintenance personnel. Once the structure is determined, the next step is to determine the levels of keying.

Levels of Keying

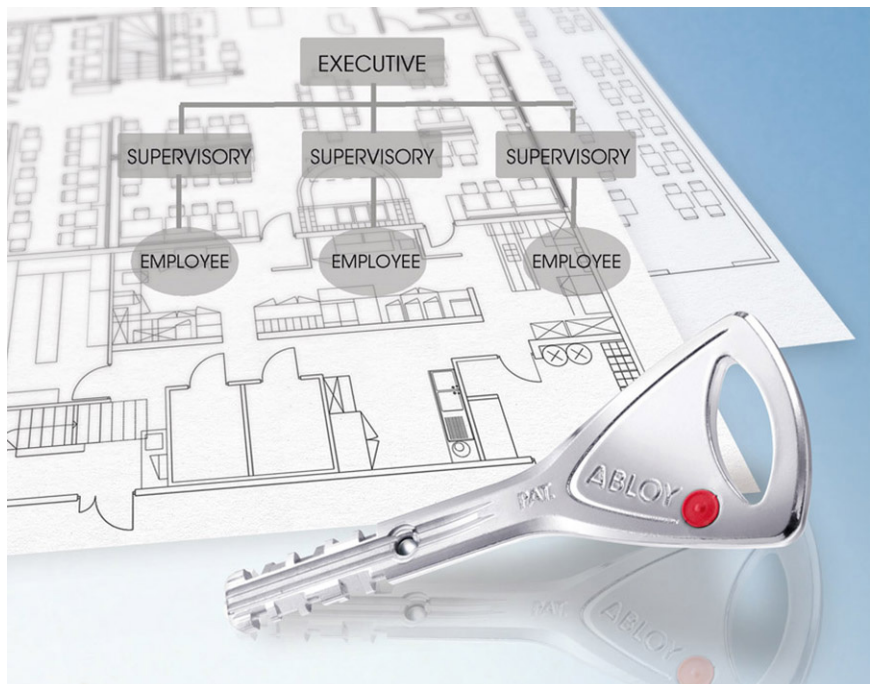
First, we must understand the concept of levels of keying.

We recommend to create the system group by group e.g. by:

- geographical area
- building
- floor
- department
- functional field/unit
- key user by function

✓ The more levels of keying - the fewer combinations at each level.

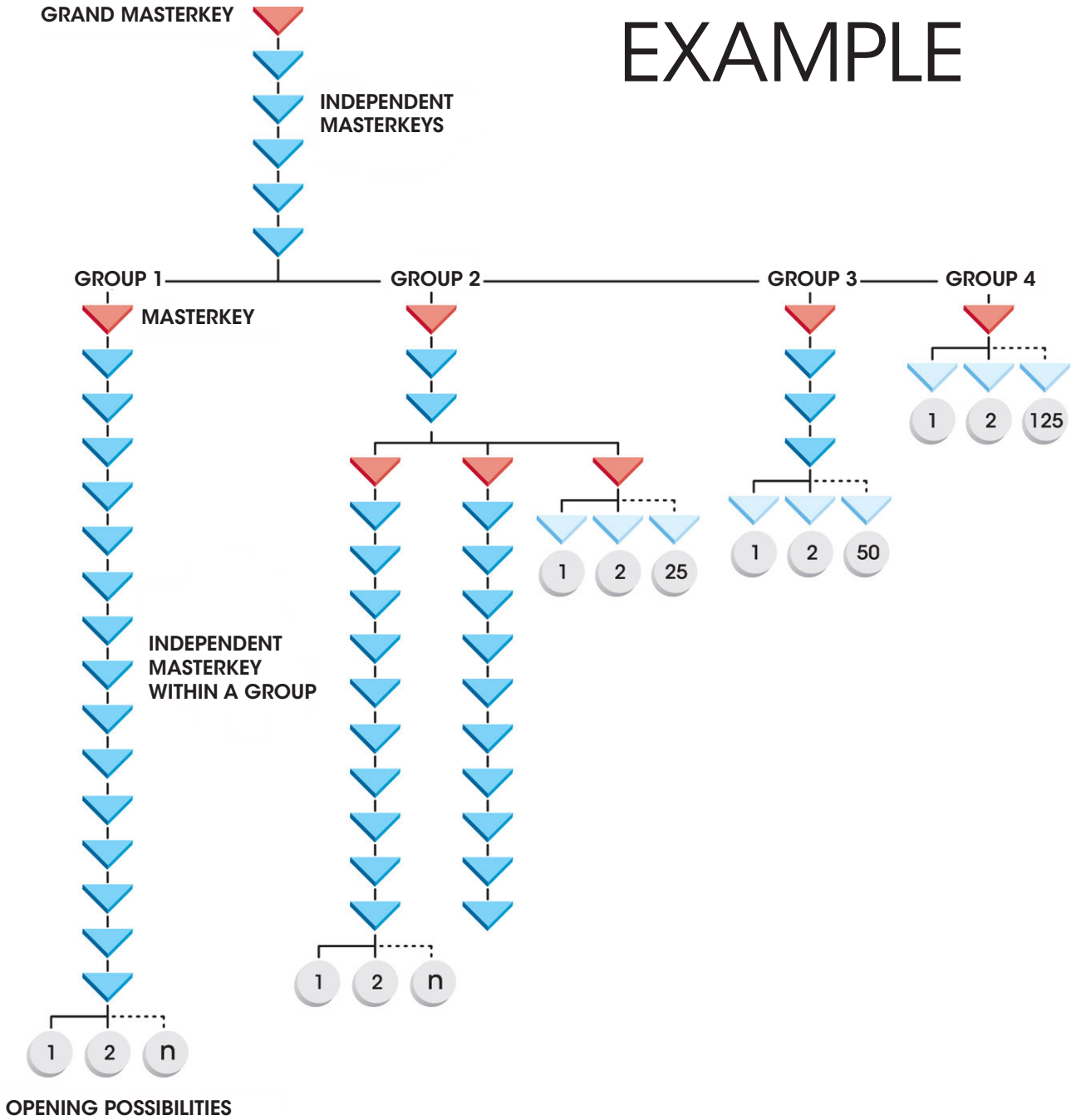
✓ The more combinations at each level - the fewer levels of keying.



PLANNING

Levels of Keying

EXAMPLE



PLANNING

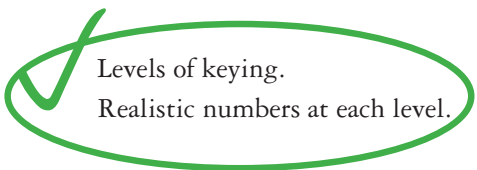
System Extensions

Define realistic extension for the number of master keys under each grand master key, and individual keys under each master key for all parts of the system. In many cases, extension is an estimation, but it must be the best possible guess.

Please consider:

What is the final size of the system?

- How many more buildings or other sections there will be in this system?
- How do future buildings or sections fit into the structure?
- What kind of key groups by function there will be?
- Which are the keys that are common to the extensions i.e. the independent master keys?
- What is the maximum number of keyed openings per floor/department/functional area that are keyed differently?
- What kind of access rights there will be?
- What are the future requirements for changes?
- What are the needed actions in case of lost or stolen keys i.e. possible rekeying of locks and cylinders?



Levels of keying.
Realistic numbers at each level.

Theoretical Numbers Reduced

The master key system overall capacity is affected by the following factors:

- cylinder system, product, keyprofile
- number of independent master keys, cross keying and central locks.

ABLOY PROTEC² CLIQ Systems

ABLOY PROTEC² CLIQ system can be a combination of mechanical and electronic keys and cylinders. Locking planning can be made taking both mechanical and electronic openings into consideration. Further information from your local ABLOY representative.



ABLOY LOCKING PLAN

ABLOY locking plan is a detailed specification of the master key system how all locks or cylinders are to be keyed as well as the product quantities, markings, finishing etc.

Specification of the details is made by using a locking planning software. ABLOY EPLANNER is the software for ABLOY sales offices and authorised distributors for the locking planning. ABLOY locksmiths, dealers, end customers and similar may use an Excel file provided by Abloy Oy, specially designed for entering all necessary information for creating an ABLOY locking plan.

How to get started:

A. Please specify keys

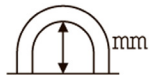
1. Key name can consists maximum 20 characters.
2. Place the most powerful key on the first line of the locking plan.
3. Enter independent master keys (if any) on the following lines.
4. Define all other master keys next.
5. Enter all individual keys group by group.
6. Enter quantity of keys.
7. Define stamping of keys (if required).
 - Maximum length of stamping in ABLOY keys is 9 characters.
 - Numbers and alphabets are recommended.
 - If any special characters are needed, please use only _(underscore) and / (slash).
 - If consecutive numbering is desired, it can be created by using - (hyphen) after the first number (eg. 0001-...)
 - Consecutive numbering is generated automatically by the software (eg. 0001, 0002, 0003, 0004...)
8. Specify colour identifications for keys (if needed).
 - Please note that if you have more than one key on a key line, all keys on one key line must use the same colour.
 - The following colours are available: black, bronze, green, white, lilac, grey, red, blue, yellow, orange.
 - For ABLOY PROTEC/PROTEC² key ways also dark green, dark brown, light red, light blue and dark lilac in addition to the above mentioned.



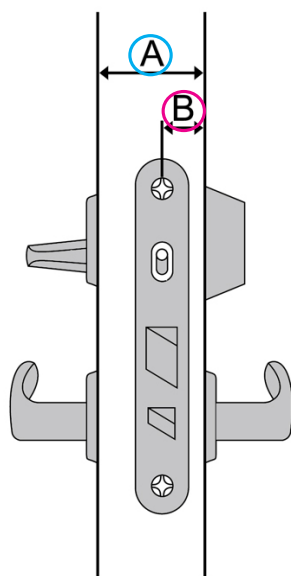
ABLOY LOCKING PLAN

B. Please specify cylinders

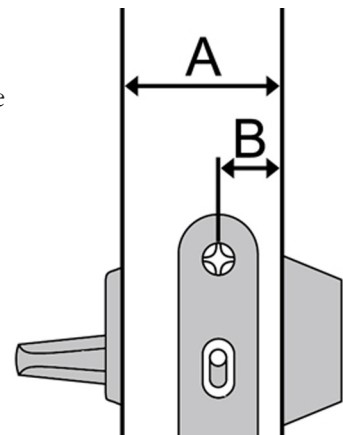
1. Please define a position number for each line of products
 - It may be for instance an identification number of the door in question.
 - Maximum length is 8 characters.
 - Numbers and alphabets are recommended.
 - If any special characters are desired, please use only _(underscore) and /(slash).
 - One position number can be used only once within a locking system and it must be different for every line.
2. If products need to be stamped
 - The stamping is required to be the same as the position number.
 - Maximum length of stamping in ABLOY products is 8 characters.
3. Product model in each position.
4. Quantity of products in each position.
5. Locking site name (if needed).
6. Finishing of the products.
7. Other details
 - 7.a. Shackle length for padlocks



- 7.b. Door dimensions A/B for Finnish type cylinders, please see below:

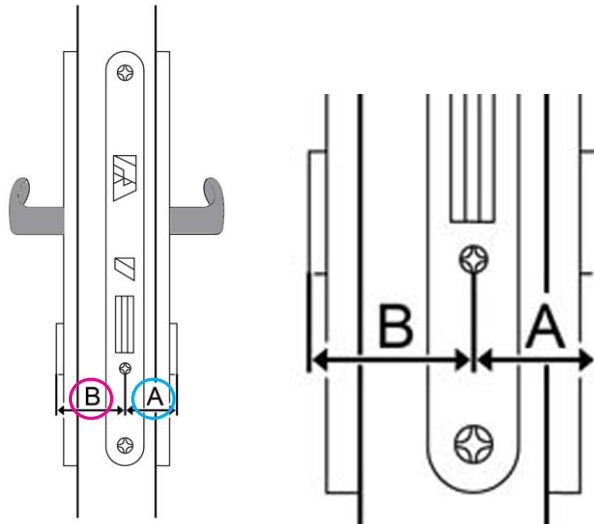


- Ⓐ = Total thickness of the door.
- Ⓑ = From the center of the cylinder fixing screw to the locking side surface of the door.



ABLOY LOCKING PLAN

7.c.Total length/door thickness for Europrofile DIN cylinders, please see below:



Europrofile DIN cylinders (total length with extension pieces/door thickness).

Double cylinder

A = Outside cylinder length. From the center of the cylinder fixing screw to the surface of the outside escutcheon.

B = Inside cylinder length. From the center of the cylinder fixing screw to the surface of the inside escutcheon.

Cylinder + knob

A = Outside cylinder length. From the center of the cylinder fixing screw to the surface of the outside escutcheon.

B = Knob side length from the center of the cylinder fixing screw to the surface of the inside escutcheon.

Single cylinder

A = Outside cylinder length. From the center of the cylinder fixing screw to the surface of the outside escutcheon.

C. Please specify keyings:

1. Please mark which keys need to open the locks/cylinders on each line.
2. Future needs as a reservation.

WHEN ORDERING EXTENSIONS, CHANGES OR ADDITIONAL ABLOY KEYS

The right to order

Every locking system must have a nominated person responsible for the system. He/she has the responsibility of the hand out/in keys and the overall key control of the system. He/she is the person to have the authorisation to order extensions, additional keys and make changes into the system by providing the correct lockings system number with the order. Abloy Oy undertakes to supply system extensions, additional keys, information or changes only if the locking system identification number is correct. Every locking system designed at Abloy Oy is provided with a unique locking system number for identification purposes and for security procedures.

Locking data

Abloy Oy factory designed systems' locking data is filed in Abloy Oy Joensuu factory archives. If the system is designed elsewhere, the organisation in question has the responsibility to archive the locking data in a secure way. It is necessary to appoint a person responsible of the locking system handling, including designing, maintenance and archiving.

FURTHER SECURITY ASPECTS

Handing out and control of ABLOY keys

Key control plays an important part in the preservation of locking system security. That is why it is vital to appoint a person who is responsible of the key control and security. The person responsible must know under all circumstances which keys have been handed out and to whom. Abloy Oy provides software for effective and easy key control.

Checklist for the person responsible of the ABLOY locking system

Ensure that you have received all the keys that have been ordered and that the keys have been stamped according to the order.

Make sure that key holder keys are handed out and in only against signature.

Should even a single key in a locking system be lost, make an immediate appraisal of the risk involved. The easier it is to identify the location the key is used for, the greater is the risk of misuse.

- Always keep master keys, all unused keys, and documents related to the locking system in a safe or in some other securely locked place.
- All key holders must be given at least the following information in order to ensure an uninterrupted security and functioning of locking system:
 - Who is the person responsible for the locking system?
 - Which locations the key holder has access to?
 - Proper handling and storage of keys.

FURTHER SECURITY ASPECTS

Storage of ABLOY keys and key blanks

Key security refers to the proper handling and control of keys and key blanks in different locations and situations.

Keys and key blanks must be stored in a locked cabinet or container in a secured area. Usage of key blanks must be controlled with a proper documentation. Only a dedicated person to a key cutting process is permitted to access key blanks and cut the keys. Keys must be cut on a factory approved key cutting machine which needs to be kept in a secured area. Keys which are wrongly cut or removed from the system need to be destroyed in a way that prevents any misuse of them.



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ASSA ABLOY

Abloy Oy is one of the leading manufacturers of locks, locking systems and architectural hardware and the world's leading developer of products in the field of electromechanical locking technology. ASSA ABLOY is the global leader in door opening solutions, dedicated to satisfying end-user needs for security, safety and convenience.