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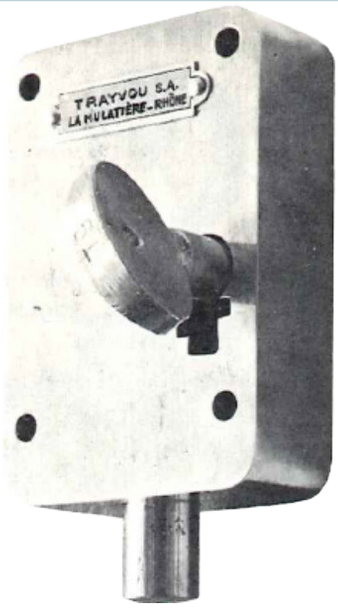
RAILWAY SAFETY

TRAPPED KEY INTERLOCKING SOLUTIONS

Maintenance - Signalling - Protection

SERV TRAYVOU INTERVERROUILLAGE

Know-how



Since 1894, STI designs and produces security devices with locking and interlocking solutions by key transfer.
Our expertise, in a field which involving millions of users, combined with that of the industrial group HALMA has enabled us to launch ranges adapted to the increasingly strict requirements of the industrial sector.
Currently Serv Trayvou is approved and acknowledged throughout the world as a leading authority in ensuring he safety of hazardous machines conforming to current safety standards.

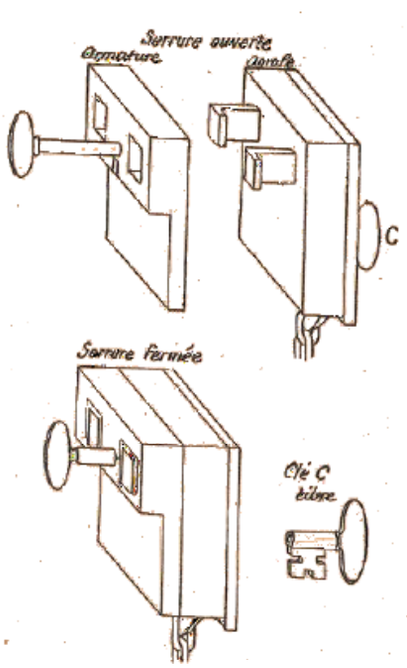
Originally devised for railway applications, our products were quickly accepted Industry-wide as a result of their simplicity and efficiency. STI has offered personnel protection in railway and power generation, chemical and petro-chemical, steel, food, industries, among others.

Specific range of products

The ranges presented below are divided into 2 families: SERV - HFS

'S-NS' RANGE	'NX' RANGE	'HFS' RANGE	'ROTARY' RANGE
Copper-alumium locks designed for heavy duty applications or agressive environments such as cement.	Fully stainless steel locks. Suitable for all types of industrial applications (mechanical or electrical). Several combinations available.	Used mainly in Energy area to guarantee safety on medium & low voltage installations (transformer, circuit breaker...)	Made in nickeled brass. Composed of rotary and cam locks for the locking of power or control circuits.

Other locking devices belonging to any of the ranges mentioned above are also recommended to secure your at risk facility.
It is mainly special solutions (for the management of logistics operations) which were finally standardized.

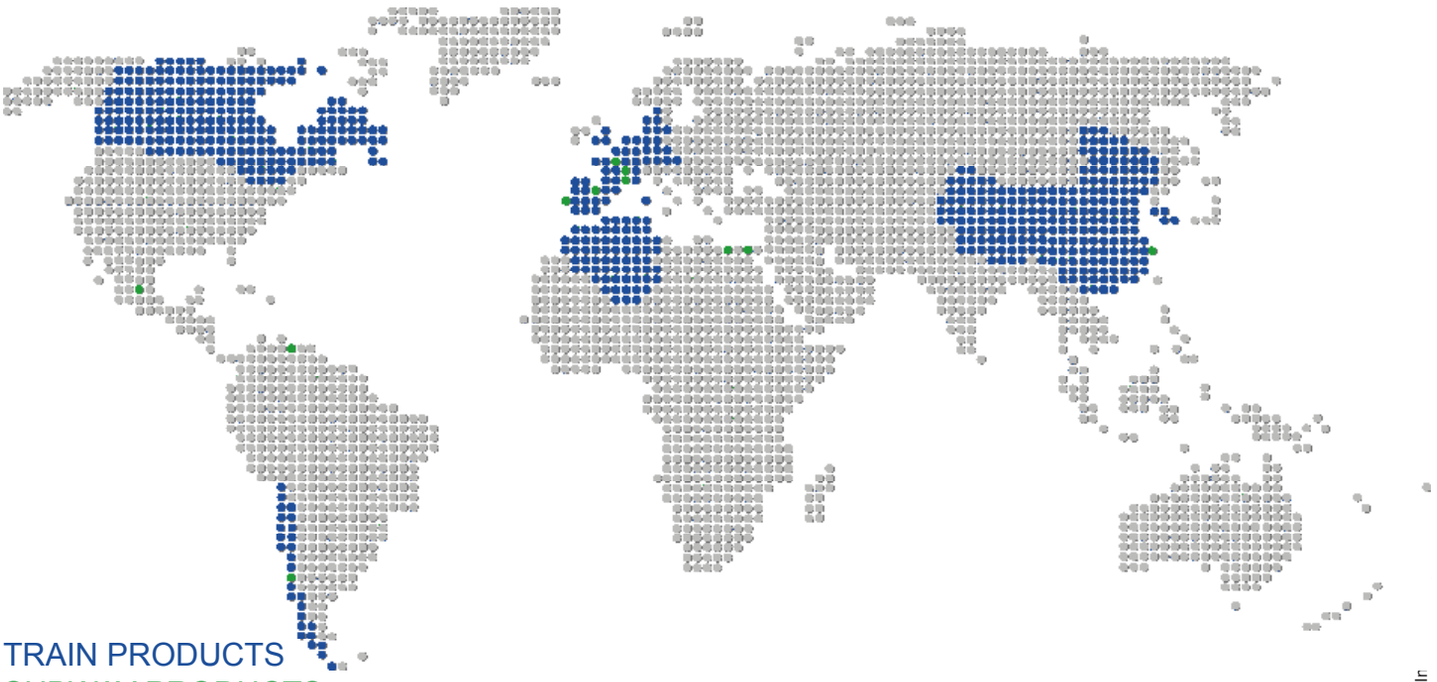


A vocation

Strengthened by a century of expertise, STI has a solid R&D department conceiving not only standard solutions but also specific safety requirements.

Most STI products confirm to the machine directive 89/37/CE which prescribes essential health and safety requirements for dangerous machines.

OUR MAIN RAILWAY REFERENCES



TRAIN PRODUCTS
SUBWAY PRODUCTS

TRAIN

France: SNCF
Algeria: SNFT
Austria: OBB
Belgium: SNCB
Canada : BOMBARDIER
Chile: FEPASA
China : CNR
England: EUROSTAR
Germany: DB (Adtranz)
Luxembourg: SCFL
Morocco: ONCF
Portugal: REFER
South Korea: EUKORAIL, ROTEM
Spain: RENFE
Swiss: SSBB
Tunisia: SNCFT, SYSTRA

SUBWAY

France : Paris (RATP), Semali, Lyon, Marseille
Chile : Santiago
China : Shanghaï Metro
Egypt : Le Caire
Mexico : Mexico
Portugal : Porto
Spain: Bilbao
Venezuela : Caracas

Worldwide:ABB, ALSTOM, ANSALDO, BALFOUR BEATLY, BOMBARDIER, CONNEX, GE TRANSPORTATION, NIPPON SIGNAL, SDCEM, SIEMENS TRANSPORTATION, VOSSLOH

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EXAMPLES OF STANDARD APPLICATIONS

Based on the idea that a key can not be in two places at the same time, our locking systems force operators to perform a predetermined sequence, particularly in relation to maintenance and operating requirements. In its most basic form, the key transfer principle involves the positive locking of the power source and access point of a machine with locks operated by a single common key.
Our extensive range of locks permits the locking of most control circuits, switchgear and access points.

By this method all of your hazardous wore areas are guaranteed to be protected with maximum security. This technology, considered to be the most effective form of industrial safety protection, can be completely automated. The system is also cost- effective as it is quick and easy to install.

BENEFITS

- Major reduction of workplace accidents.
- Easy to install and integrate into your working process.
- Predetermined sequence of actions to be completed before access to a dangerous area or machine.
- No wiring needed

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RAIL SIGNALLING

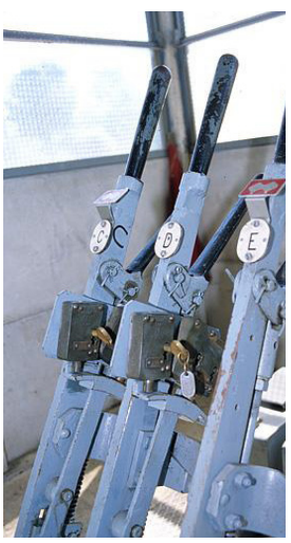
TYPE "S" BOLTLOCKS AND KEYS

Keys and locks "S" series are intented for railway applications for locking different moving parts such as:

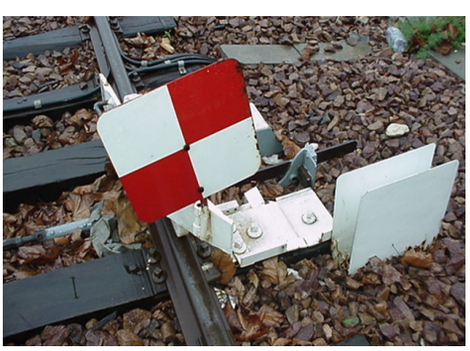
- Lever operated junction
- Operated junction box
- Overhad cable (catenary) switch
- Transmitter
- Key switch
- Etc.

APPLICATION EXAMPLE

Overhad cable (catenary) switch



Operated junction box



Locks for railblocks

Operated junction box

Key switch

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TYPE "S" BOLTLOCKS AND KEYS
S1P1

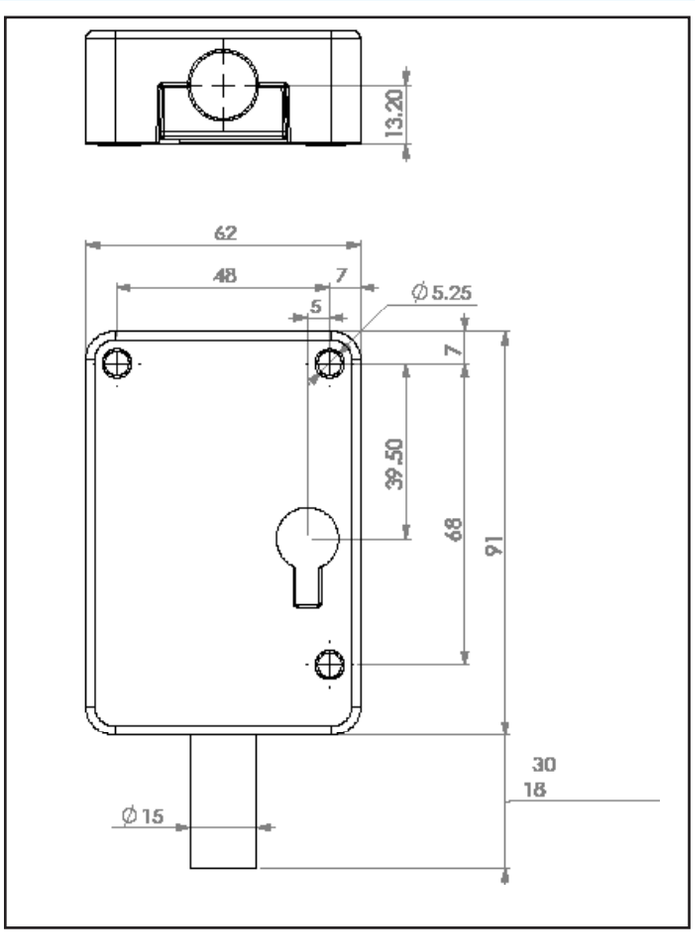
Keys and locks "S" series are intented for railway applications for locking different moving parts such as:
- Lever operated junction
- Operated junction box
- Overhad cable (catenary) switch
- Transmitter
- Key switch
- Etc.

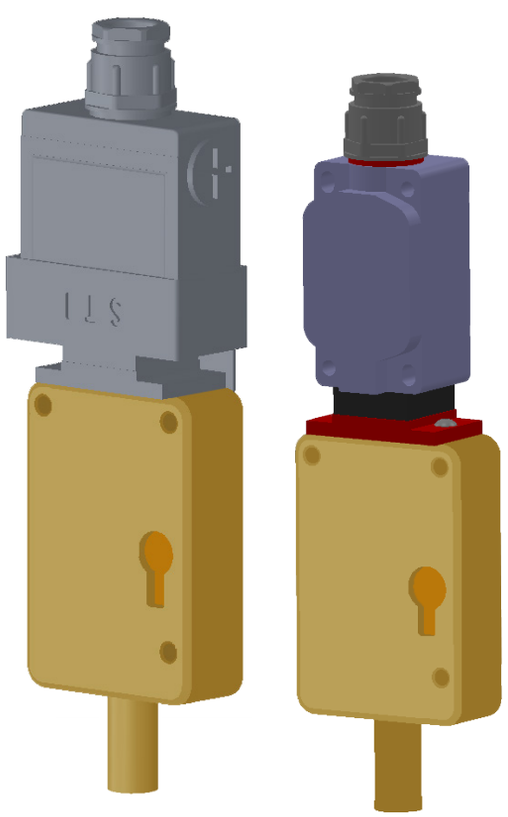
FEATURES

Material : Bronze
Bolt diameter : 15 mm
Fixing : 3 holes with a diameter of 5 mm

Options : Electrical contact 2O-2C - Switch function in key free position
Electrical contact 1O-1C - Switch function in key free position
Switch position : Front, back, reversed

DIMENSIONS





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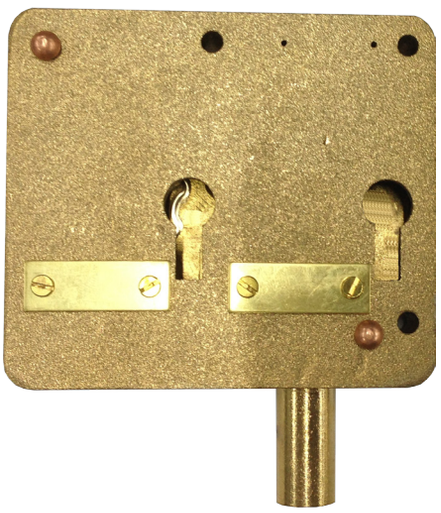
TYPE "S" BOLTLOCKS AND KEYS
S1P2



Keys and locks "S" series are intented for railway applications for locking different moving parts such as:

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- Key switch
- Etc.

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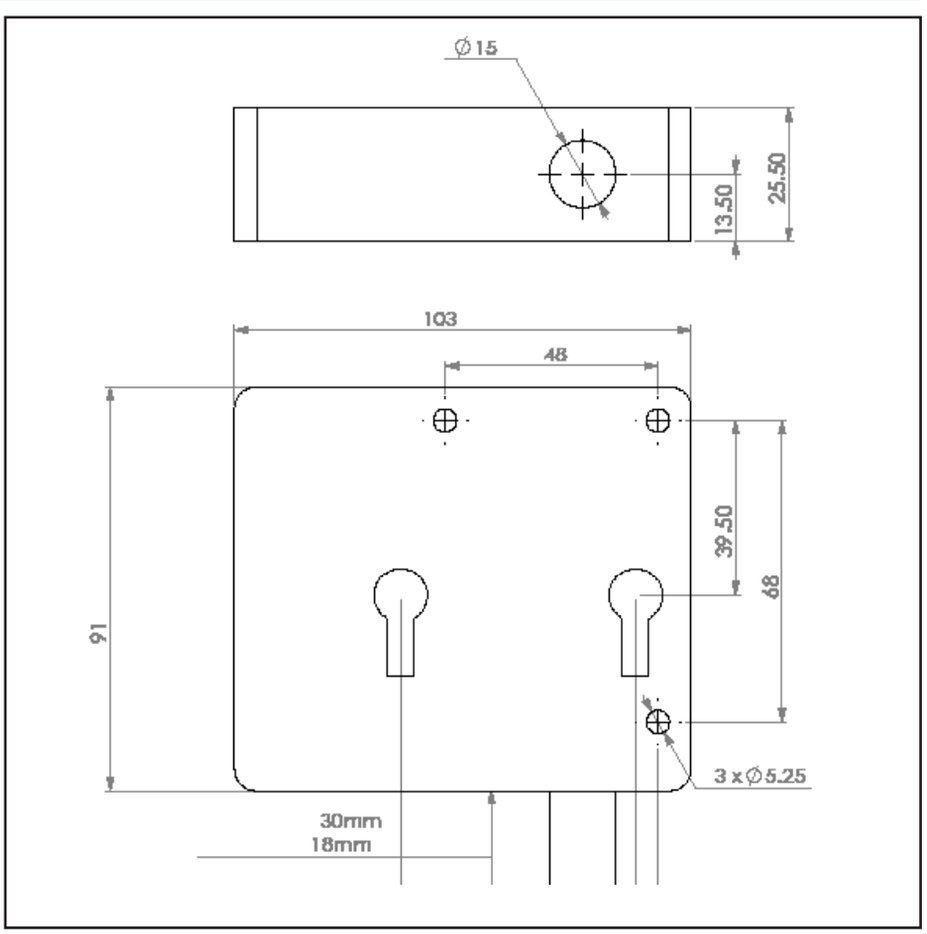
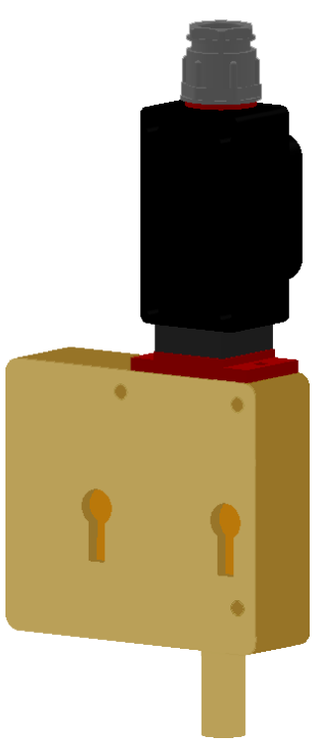
DIMENSIONS





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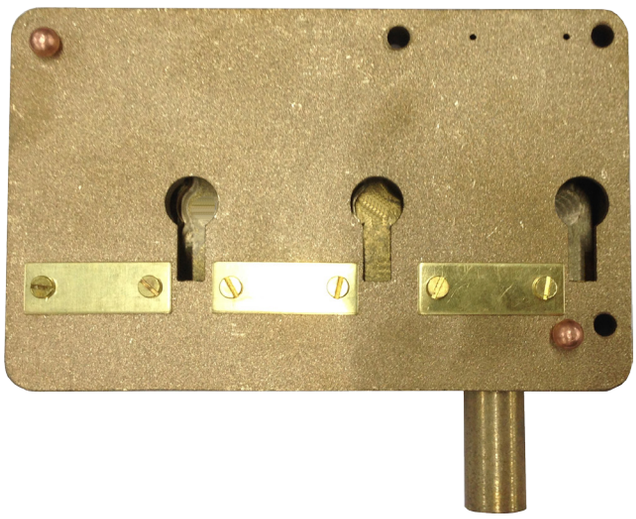
TYPE "S" BOLTLOCKS AND KEYS
S1P3



Keys and locks "S" series are intented for railway applications for locking different moving parts such as:
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- Operated junction box
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- Transmitter
- Key switch
- Etc.

FEATURES

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Fixing : 3 holes with a diameter of 5 mm

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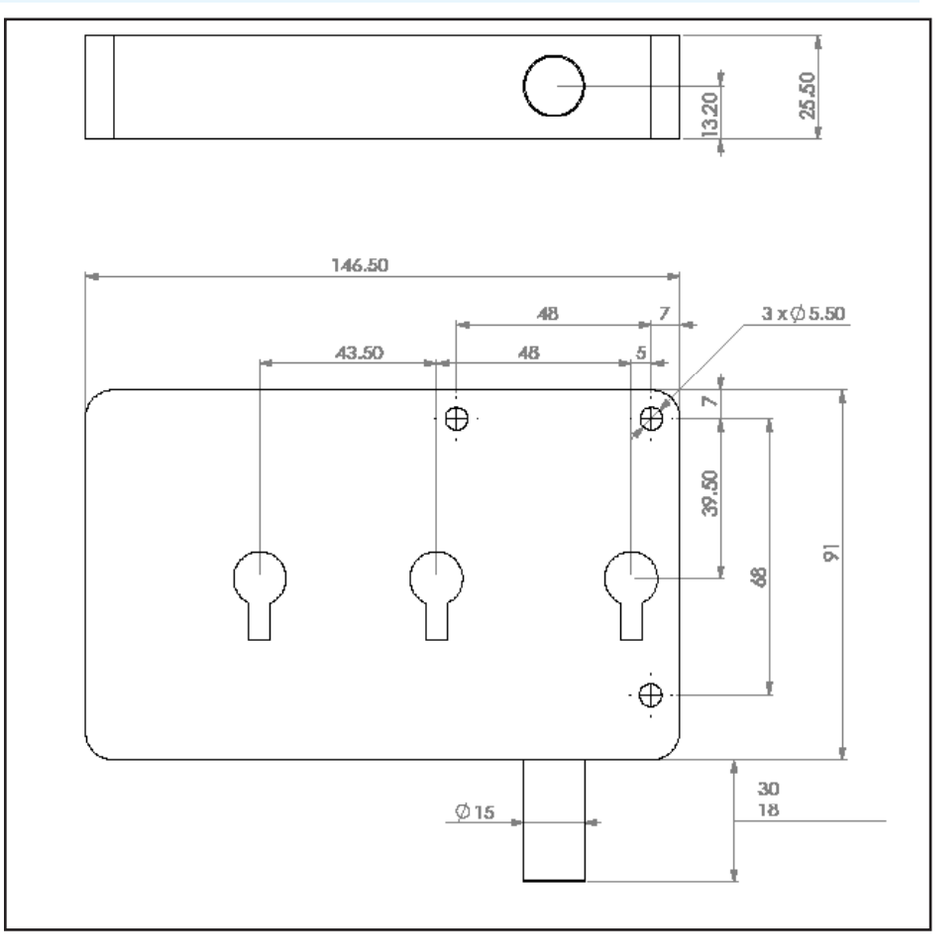
Electrical contact 1O-1C - Switch function in key free position
Switch position : Front, back, reversed

DIMENSIONS



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PADLOCKABLE PUSH BUTTON
Simple version

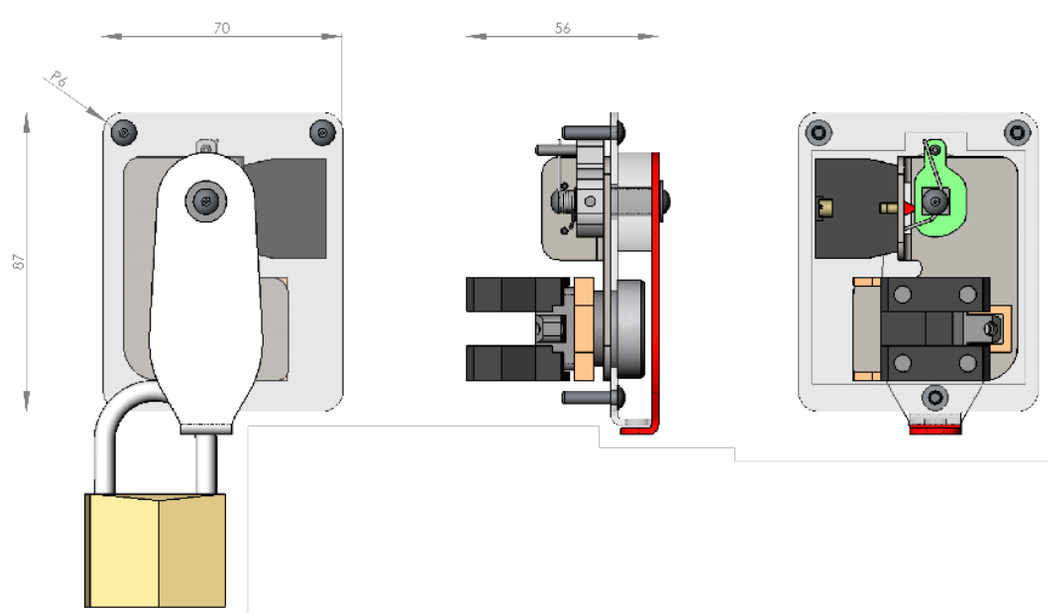
System used to padlocking push button to limit or secure access.

Push button is available with or without LED, with various colours.

FEATURES

Push button	: Diameter 22 mm
Type of button	: Various colours, with or without LED (Please refer to us)
Swith	: To lock and push button
Type of switch	: Different type are available (Please refer to us)
Padlock side bolt	: 8 mm maximum
Operating voltage	: Different type are available (Please refer to us)

DIMENSIONS



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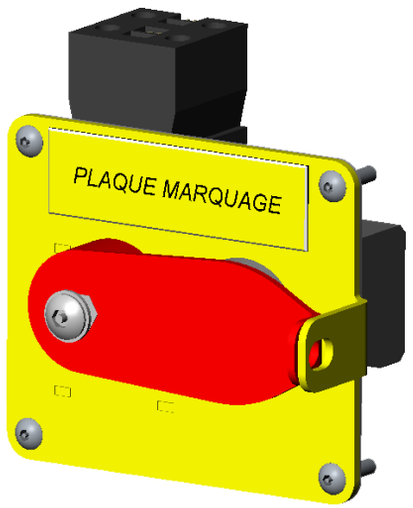
PADLOCKABLE PUSH BUTTON
With marking



System used to padlocking push button to limit or secure access.

Push button is available with or without LED, with various colours.

FEATURES

Push button	: Diameter 22 mm
Type of button	: Various colours, with or without LED (Please refer to us)
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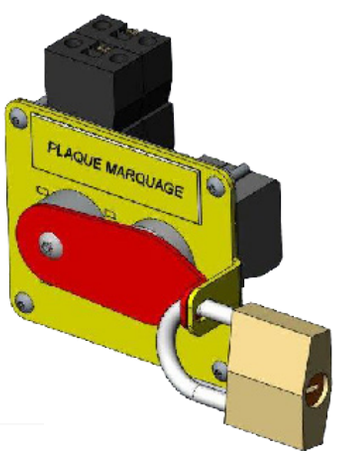
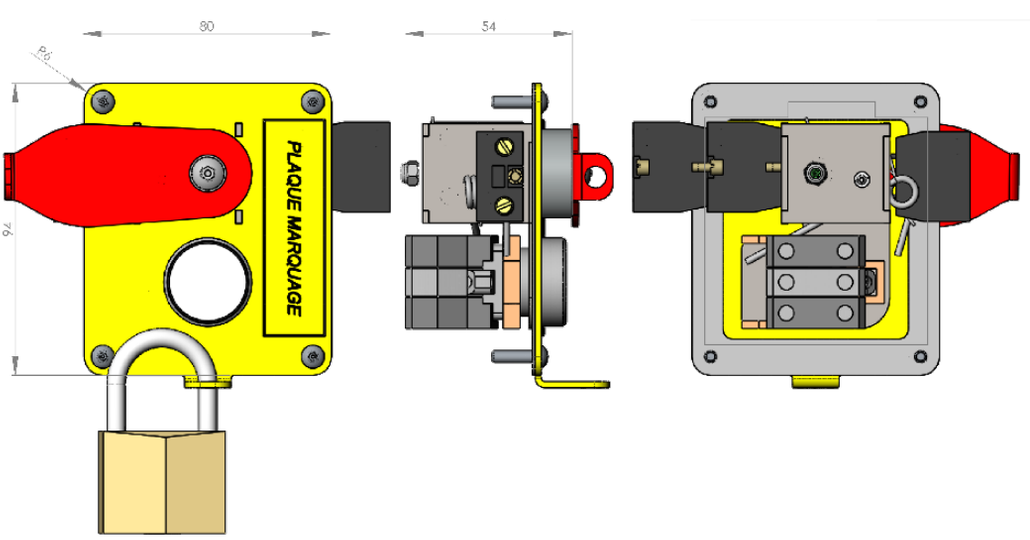
Type of switch	: Different type are available (Please refer to us)
Padlock side bolt	: 8 mm maximum
Operating voltage	: Different type are available (Please refer to us)



DIMENSIONS



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PADLOCKABLE PUSH BUTTON
Examples

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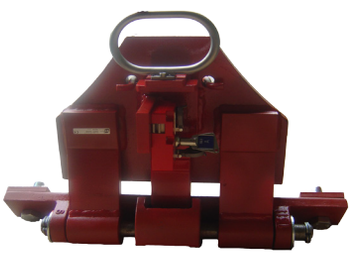
SAFETY LOCK FOR RAILBLOCKS / STOPPER
Wagon shoe

This system is used to fix the cargo wagon during loading and unloading.

FEATURES

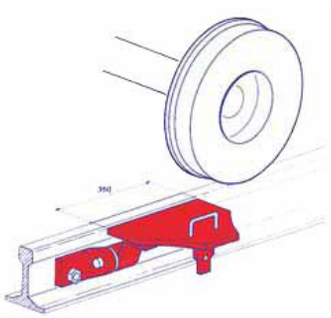


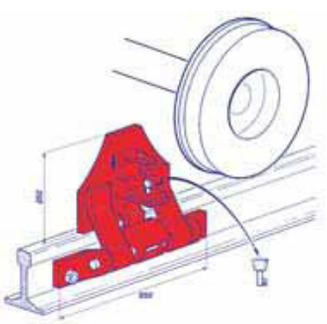
Lock : Standard solution with NS range (Example: Bolt lock NXO1P)

(refer to the NS datasheet for details)

OPERATION

After locking the wheel, the key is released. To remove the wagon shoe, trap the key and pull the handle.





DIMENSIONS

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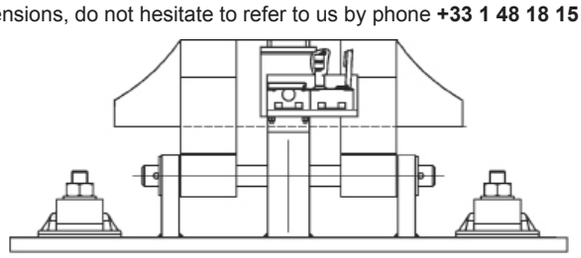

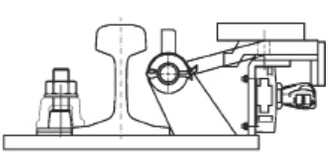

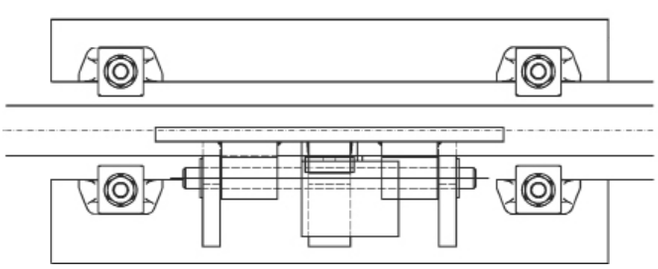

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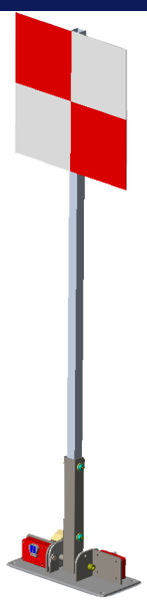
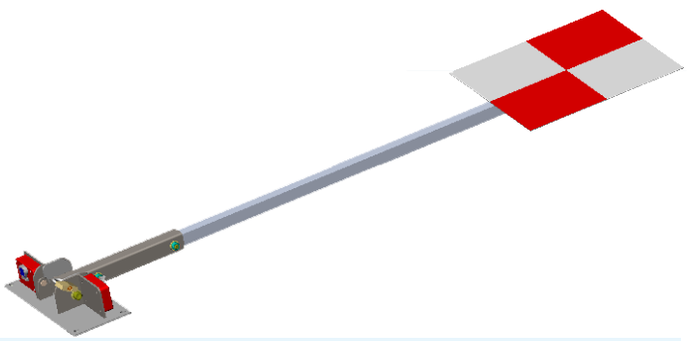
MARKER WITH SAFETY LOCKING



Base plate locking system for marker solution



EXAMPLE

DIMENSIONS

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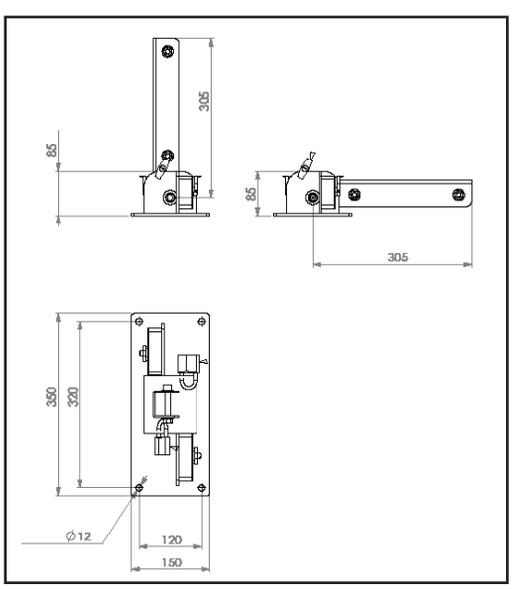

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KEY SWITCH UNIT

Example: Key switch unit with “S” lock, used to safety manoeuvring for operated junction

- Without lock:
  Reference Saxby 1959
- With lock SNCF symbol:

Swith block with 1 key and 1 switching element	79440312
Swith block with 1 key and 1 switching elements	79440313
Swith block with 2 keys and 1 switching element	79440314
Swith block with 2 keys and 2 switching elements	79440308
Swith block with 3 keys and 1 switching element	79440573
Swith block with 3 keys and 2 switching elements	79440574

FEATURES

Material : Enclosure stainless steel 316
Lock : 1 to 3 key entries, “S” or NS type lock
Switch : 2O-1C on operating key position
Hood : Protective cover per key

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KEY TRANSMITTER WITH REPEATER

The key transmitter with repeater is used to:
- Trapped the key in a given location and release the duplicate key in other location
- For motorized operation with ending signal, to release the key from a remote location (example: a motorized switch catenary with transmitter in maintenance area)

Transmitter is identified by a special plate marked. A circular and mechanical indicator with symbols shows the status of the transmitter.

- Without lock:
  Reference Saxby 674
- With lock SNCF symbol:

Transmitter with 1 key	79471079
Transmitter with 2 keys	79471080
Transmitter with 3 keys	79471081

FEATURES

Material : Enclosure stainless steel 316
Lock : 1 to 3 key entries, “S” or NS type lock
Switch : 1 or 2 switching element

Options : Protective cover per key secured with a padlock

DIMENSIONS

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ELECTRICAL KEY TRANSMITTER
TR

OPERATION

When two units installed in a remote position are associated, an electrical key transmitter can be used to eliminate the need to carry keys thus ensuring prompt and safe operation.

Electric connection between each transmitter is required.

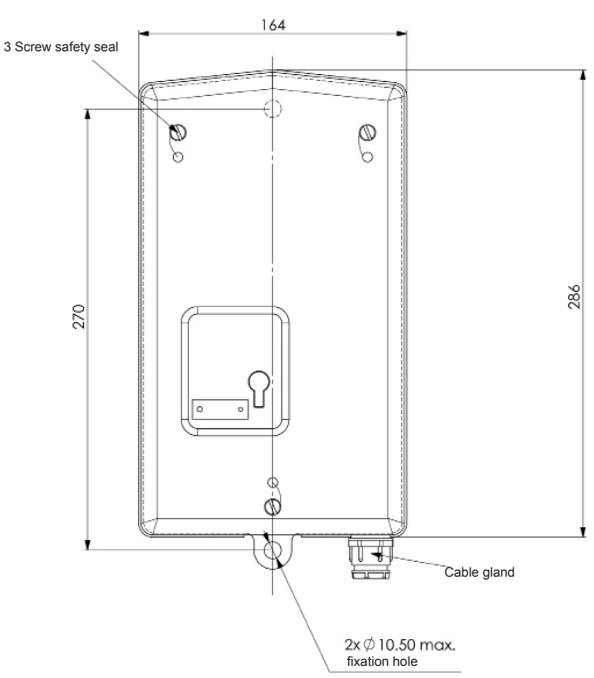
It contain:

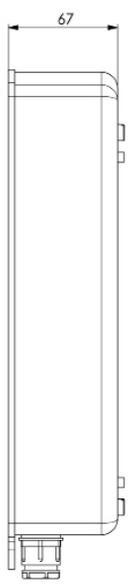
- A projecting bolt lock to receive the key or keys to be transmitted (maximum 4)
- An electrical magnet locking device and set of contacts actuated by the bolt lock, inhibiting key releases if all conditions are not met.

- **Option** : 2 or 3 key entries

Electrical specifications = 24 VDC

DIMENSIONS





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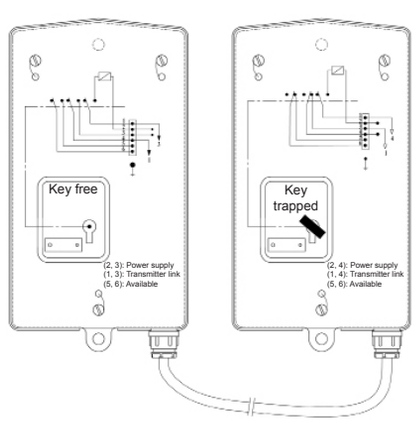
WIRING DIAGRAM



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ANTI-VANDAL CABINET FOR RAILWAY TRACK

To secure equipment used of the rail network.

Vandal-proof cabinet.

Small and Large version.

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MAINTENANCE

INTERLOCK FOR MECHANICAL DEVICE
NS Boltlock

NSOP15 is a lock available with 1 or more key entries (according to your application) used for the mechanical locking of switches, circuit breakers, etc..

> Without electrical contacts, this device does not requires any wiring (Key transfer function)

> With an electrical contact in positive security (exchanger, latch or bolt), the lock NS allows to lock a control circuit or a feedback of information.

Positive security: Opening of the circuit by the wrenching of the contact related to the key operation.

FEATURES

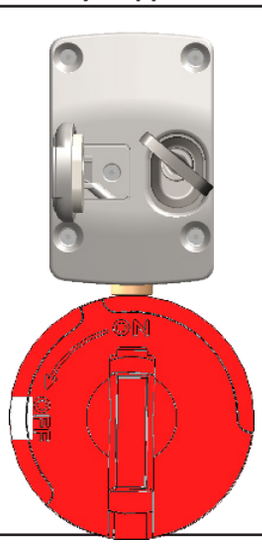
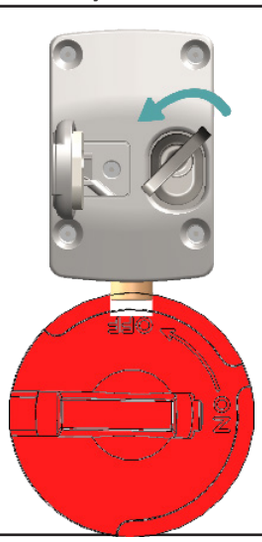
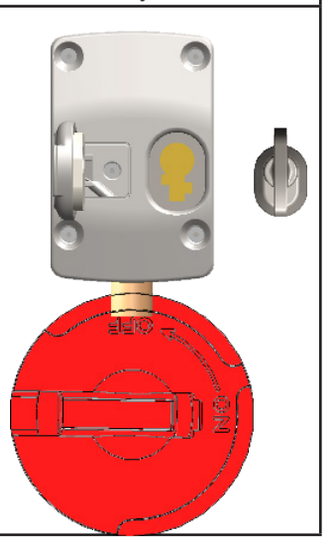
Material	**:** Copper brushed aluminium for mechanisms - stainless steel lid 304
Temperature	**:** -25˚C to 125˚C (without electrical contacts)
	: -25˚C to 70˚C (with electrical contacts)
Finition	**:** Passivation
Options	**:** 400˚C, not painted, without electrical contacts, without flip cap Contentric bolt Contact 2O-2C (IP66 for electrical contact only, sealing possible) NS22 - Switch function in key free position Without flip cap

OPERATION

Key position defines the position of the bolt. The key rotation moves the bolt.

The electrical contacts allow the locking of control circuits and/or the information feedback.

- Key free / bolt extended
- Key trapped / bolt retracted

	Machine ON Key trapped	Mid Position Key turned	Machine OFF Key free
PRINCIPLE			

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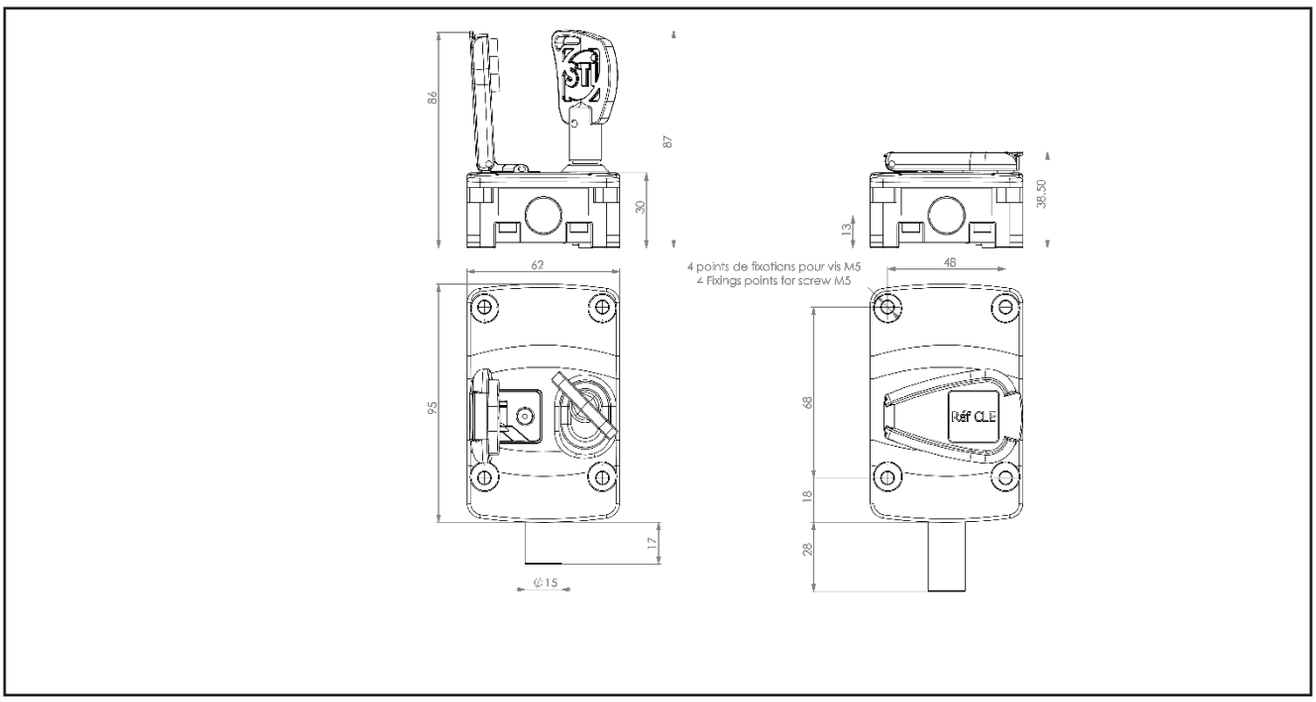
DIMENSIONS



OTHER EXISTING CONFIGURATIONS

NSOOP 15 / bolt lock with dual key entry (2 keys free)
2 free keys – bolt extended

NS1OP15 / bolt lock with 2 key entries (Exchange function)
1 Key trapped - 1 Key free - bolt extended

NSOOOP 15 / bolt lock with 3 key entries (release of 3 keys)
3 free keys – bolt extended

NS1OOP15 / bolt lock with 3 key entries (Exchange function)
1 Key trapped - 2 Keys free - bolt extended

NS11OP15 / bolt lock with 3 key entries (Exchange function)
2 Keys trapped - 1 Key free - bolt extended

Option : left or central bolt

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SOLENOID CONTROLLED interlock switch
PERTK for type "S" key

This device is used for the locking of power and/or control circuits in open position up to 22Kw under 3x380V AC3, with authorisation of the end of cycle, robot, temporisation, null velocity pick-up…

Lock is embedable on a mounted panel with 1 or several key entries. It can be equipped with a rotary switch allowing the release or the trapping (by voltage output) of one or more keys after an authorisation signal.

The electromechanical lock is equipped with:

- a solenoïd for the locking or unlocking of the principal key.
  The position of the contacts is associated with the control of the principal key (left key when there are several entries).
- drawback mechanism of the main key locking in case of a solenoïd dysfunctionment (100% positive security).
- a green LED power indicator.
- a pushbutton of voluntary operation and energy saving.
- an internal wiring connector block.
- a mechanical override system with a key that is used in case of power failure

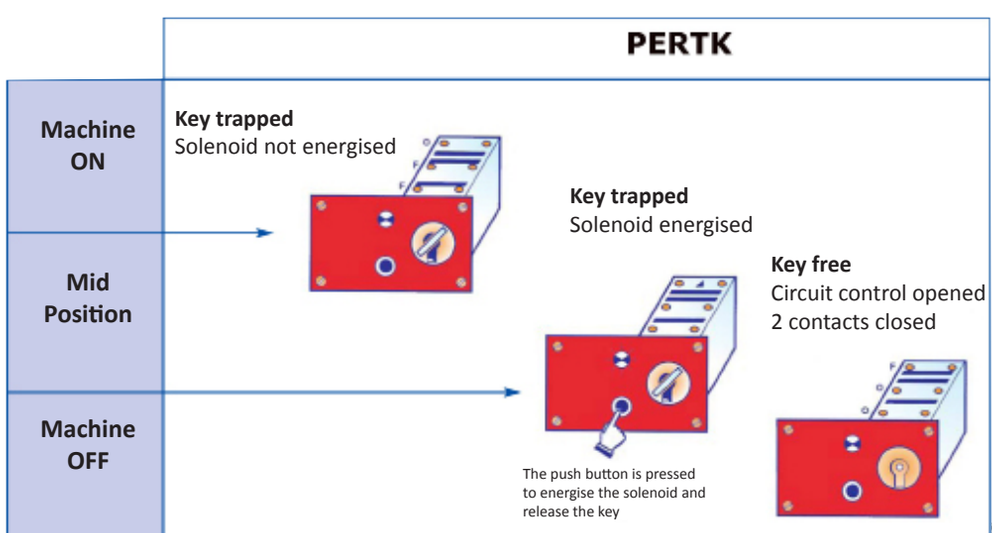
FEATURES

N° of Key entries	**:** 1 to 5
Barrel	**:** Nickelled brass
Finish of front panel	**:** Red (RAL 3000) polyester paint valid from 2 to 5 key entries
Temperature	**:** -20˚C to +70˚C
Key entry	**:** Stainless steel 304
Mounting	**:** On panel
Protection	**:** IP40 depending on type of mounting
Voltage	**:** 24V, 48V, 110V or 220V AC or DC
Solenoïd	**:** Duty ratio 15%
Wiring limit	**:** Wiring connection on electronic card = 1.5mm² maximum.
Switch	**:** Number of contacts, power and connection, see table

OPERATION

- SP version (key release): After authorisation signal, the green indicator illuminates. To release the key, press the pushbutton (maximum 30s.).
- RP version (key trapped): After authorisation signal, the green indicator illuminates. To trap the key, press the pushbutton (maximum 30s.).

The mechanical override system with a key to be used in the event of power failure (where there is no authorisation signal). It is necessary to keep this key in a protected place



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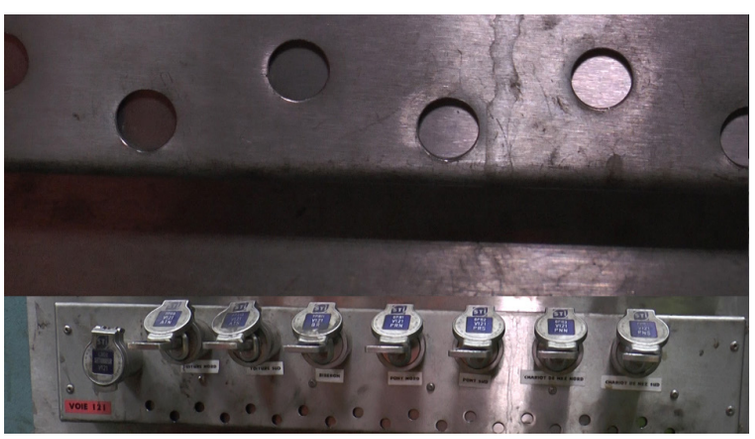
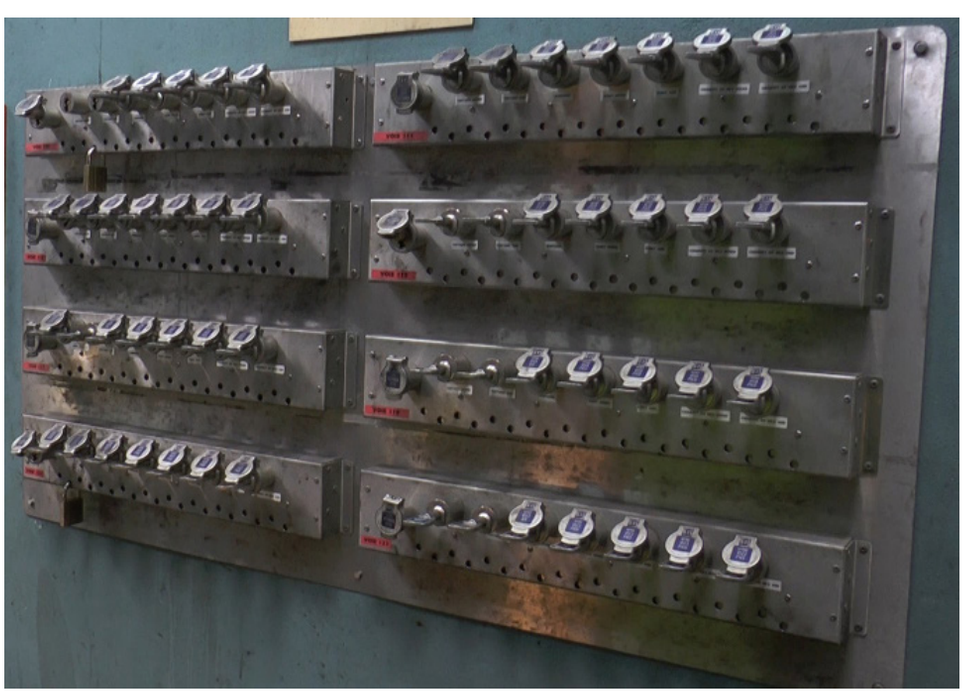
KEY MANAGEMENT PANEL
Padlock harrow

Padlock harrow allow to trap keys to ensure the safety maintenance area.
With key trapped, all maintenance operator can release the key from their areas.
The harrow allow to have some operators in the same area. Each operator trap padlock.

All maintenance area keys and all padlock must be release to rehabilitate the system.





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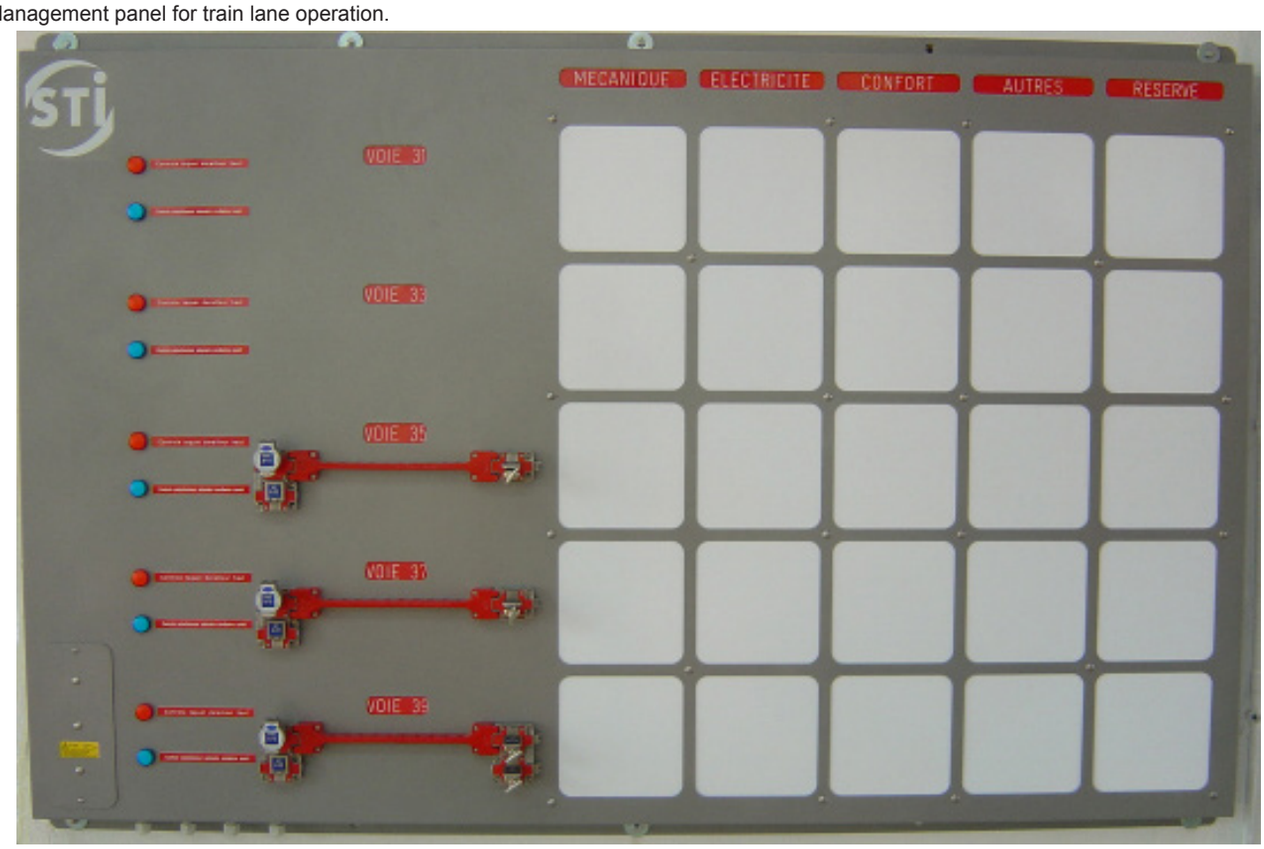
KEY MANAGEMENT PANEL
Optical panel

Management panel for train lane operation.



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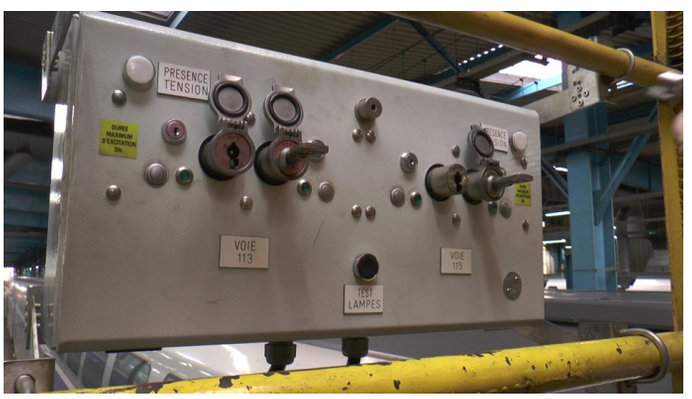
PLATFORM ACCESS MANAGEMENT WITH GAP FILLER CONTROL SYSTEM

Operator trap the key and can manage platform mobile part with Gap Filler.

This system can be installes inside or outside area



When workshop area is safe, the system release the key to open the access.

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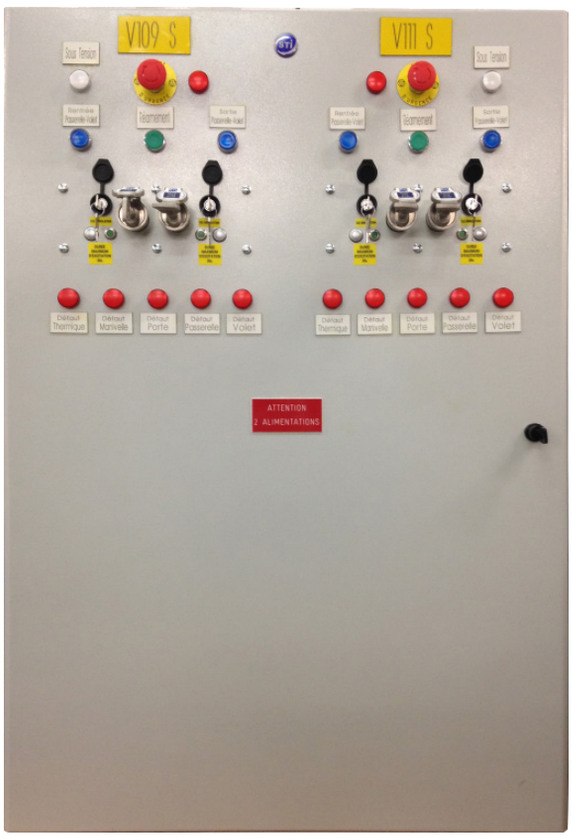
ROOF ACCESS AUTHORISATION
Automated system



Complete safety system for the railway market and all customers using mobile platforms. This innovation ensures superior platform positioning, guaranteeing the safety of people and the protection of materials and assets.
It is a turnkey solution created and mastered by STI.
The production associates interlocking systems (controlled by PLC platforms and programs) and safety loops. It can be installed on both new and existing platforms.

For railway applications, when a train is in a maintenance area, the system can only be activated when the catenary power is off.
The operator uses a single button to request the establishment of the platform. The autonomous system builds the platform and it is placed adjacent to the train leaving no space, to alleviate the potential of fall hazards, whilst at the same time providing a solution that eliminates risk of damage to the train.
The system is fully automated and is compatible with dierent size trains, with carrying platform position requirements.

For more information, please refer to us **+33 1 48 18 15 15** or by mail **sales@servtrayvou.com**

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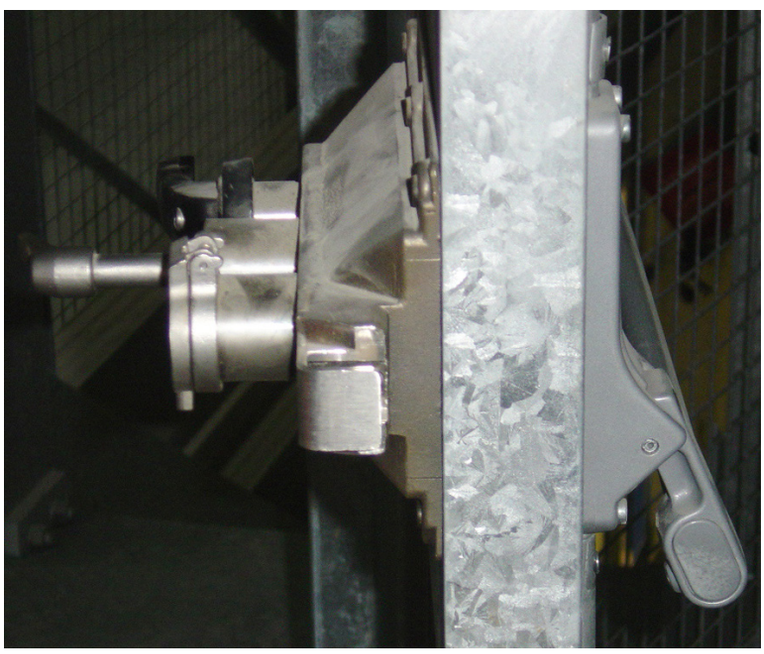
ROOF ACCESS PLATFORM
KCEDIX

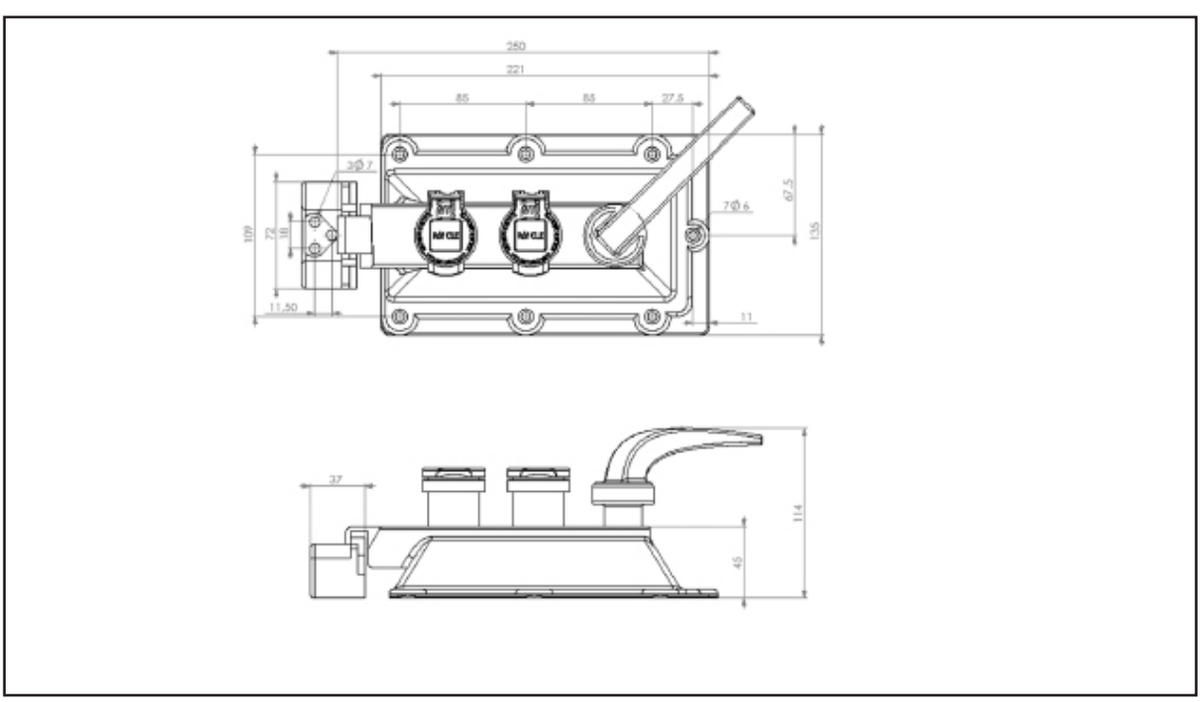
Locking roof platform area with panic bar for emergency evacuation.
- Very long platform
- Single system with trapped key interlocking and panic bar

FEATURES

Material : Brass / Stainless steel



DIMENSIONS



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NOSE CATWALK

Securing nose catwalk.
Nose catwalk is often used for different lane. The trapped key system allow to guarantee maintenance in safety conditions and lock nose catwalk with one lane.

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ROLLING CRANE

Rolling crane management:
- Release the key only if the rolling crane is on park position (trolley and mattress to the center, hook to the top)
- Limited use to single lane or 2 lanes if 1 or all keys are trapped

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ROLLING CRANE
Variant implementing

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SUBFLOOR LIFTING PLANTS

Management and authorisation of subfloor lifting plants with electromechanical trapped key system.

Example of successful collaboration with Windhoff Company

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ELEVATOR COWLING

Maximum operating height without authorisation 1,20 m.
Hereafter, trapped key system allow to use elevator cowling with catenary powered off.

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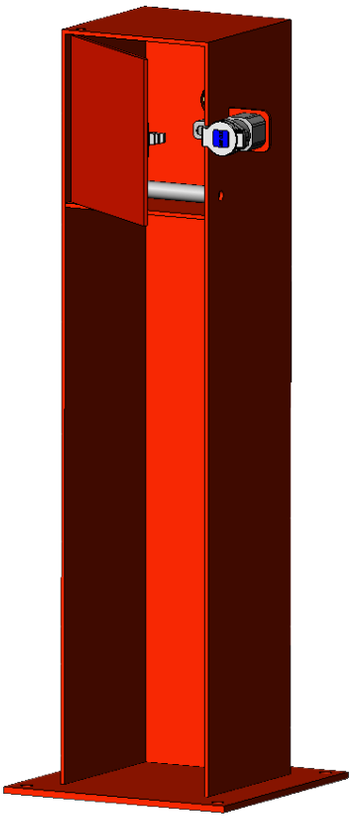
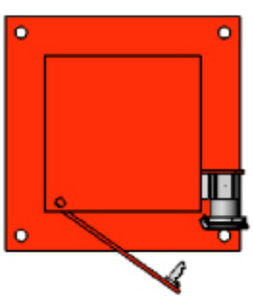
RESTING BOX

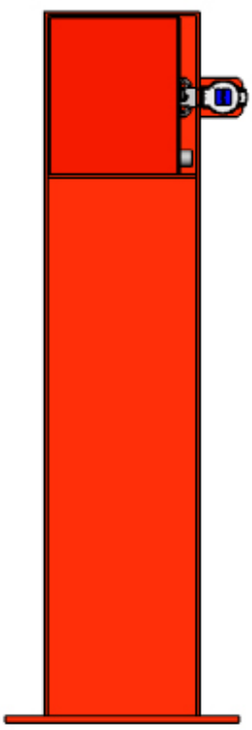


The cable or hose is passed through the support (roller with guide) before you put the outlet.
The front door is locked by RTG type and prevents output of the cable or hose.

The key could open this component, in order to pull on the cable or flexible, to be supported by a roller to avoid friction causing any deterioration. Impossible Inability to close the door if the cable or hose is out of the box.
Front door open = Trapped key

- 12 Vollt electrical outlet
- 4 000 Volt electrical outlet
- Etc.





VARIANT IMPLANTING

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CUSTOM MADE AND CUSTOMISE

Serv Trayvou Interverrouillage company develop some projects to find the best safety solution for each requirement.
All products can be adapted to existing facilities.

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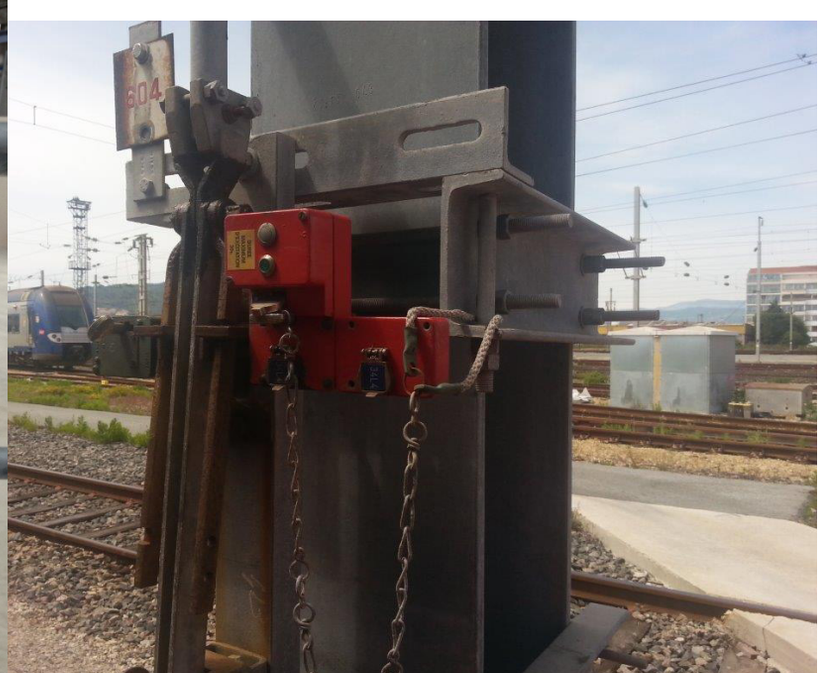
CUSTOM MADE AND CUSTOMISE



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Lock your safety

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