

CK PUSH BUTTON

MAFELEC and TSL-ESCHA GmbH

MAFELEC develops control and signaling solutions for harsh environments. From push buttons to switches, from complete control panels to door control solutions, the company offers products that are best suited to the needs of our partners.

TSL stands for Touch, Signal and Light. Door opening push buttons, signal lights, sounders, indicator and display devices as well as LED lighting are part of the product portfolio. TSL-ESCHA develops, manufactures, and distributes individual customer solutions for public transportation.

Members of the MAFELEC TEAM

TSL-ESCHA based in Halver (Germany) and MAFELEC in Chimilin (France) are part of the MAFELEC TEAM. The owner-managed group of companies offers solutions for HMI, lighting and sensors and is active in the markets of bus and railway, industrial vehicle, industry, energy, defense, aerospace, and elevators.

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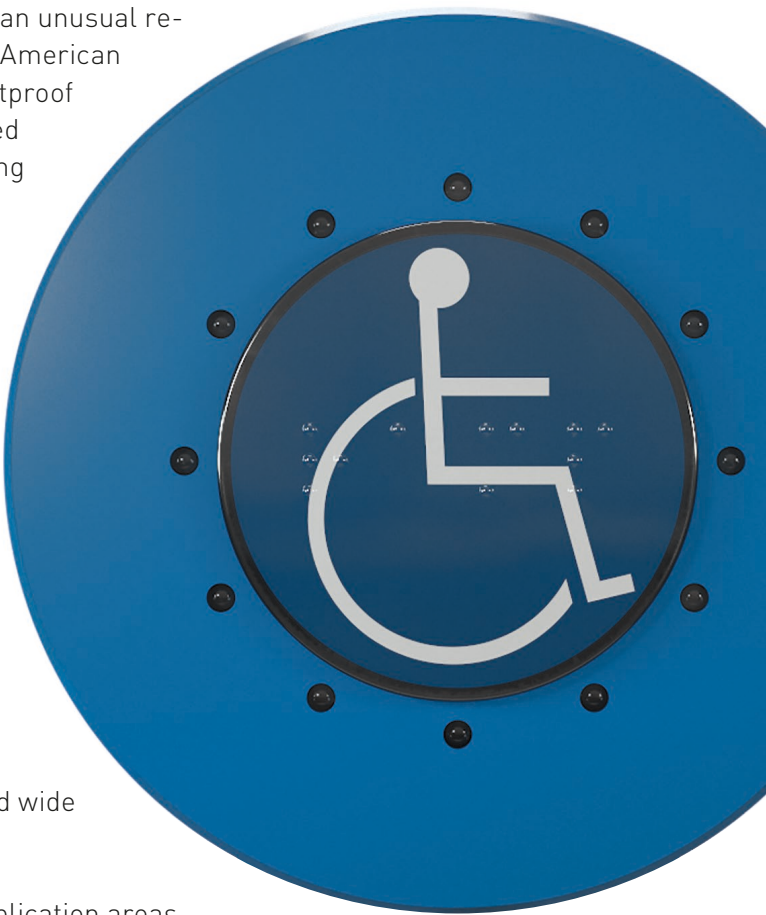
CK PUSH BUTTONS

CK SERIES VERSATILE USABLE

The development of the Combikey push button is based on an unusual request that TSL-ESCHA received several years ago from an American customer from North America: a US prison needed a bulletproof push button. England’s public transport system also needed robust push buttons, with increasing demand due to growing vandalism. We thus developed a robust and flat TSL push button with a completely metallic outer surface – the CK.

The CK push button family is characterized by a wide range of possible combinations: various circuit diagrams, touch surfaces, front panels, LED colors, pictograms and tactile symbols. A variety of light and sound signals are available to suit your specific requirements. An hourglass effect display is another option in order to indicate waiting times in front of doors. Combikey door opening push buttons have already proven their quality in buses, trams, subways, as well as in regional and high-speed trains for many years.

- Robust housing technology, high degree of protection and wide operating temperature range
- Seven construction types enable usage in a variety of application areas
- Sound and light signals meet the requirements, hourglass effect display also possible
- Variants with tactile symbols and braille for the visually impaired



The CK convinces with a flat design and a robust stainless steel front bezel.

Due to different designs, the CK push button can be used in glass doors as well as in the sidepanel of the vehicle.

CK PUSH BUTTON PARTICULARLY FLAT AND ROBUST

The front panel of the CK is made of stainless steel. This makes the push button particularly robust. Another plus point: the CK push button is flat in design and installation. This makes the Combikey the ideal solution for thin walls and narrow passages. The flat design is also useful for cleaning.

In order to protect the pictogram, TSL-ESCHA invented a transparent button surface that shields against wear and tear as well as vandalism. To ensure that the touch surface remains durable and resistant, a special coating option provides protection against graffiti removers and aggressive cleaning agents.

- Proven chemical resistance to many surface cleaners
- Front or rear screwable
- Cable outlet with various connector options
- Additional option with coating resistant to graffiti remover
- Optimal for use in lavatories
- Complies with the current standards for rail vehicles (TSI-PRM, EN 14752, EN 16584-2, EN 50155, EN 45545-2 and EN 61373)



Optimal for use in narrow passages as well as for flat installation spaces.

CK VARIANTS AT A GLANCE

A CONVINCING SELECTION

The CK push button series offers a large selection of different designs.

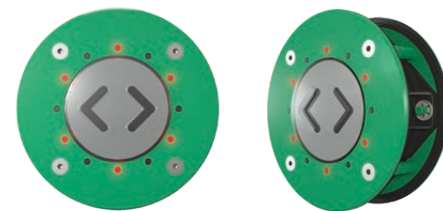
CK's modular design makes it possible to combine pictograms and tactile touch surfaces. The tactile symbols are raised and their shape and size meet legal requirements and those set by the EN 14752 standard (side entry systems for rail vehicles) and TSI-PRM (Technical Specification for Interoperability – Accessibility for persons with reduced mobility).

For the variants with double-sided function (design 1 and 2), the electronic connection between the two push buttons is wireless and functions via integrated plug connectors with distance compensation. In addition, these two designs have IP67 protection to the outside of the vehicle.

More detailed information about dimensions can be found on our website.

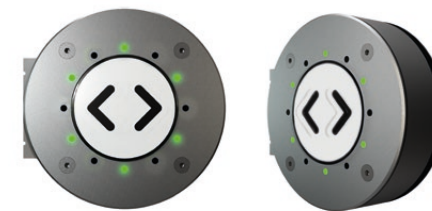


CONSTRUCTION TYPE 1
CK70-1, CK71-1, CK72-1



- Function: double-sided
- Application area: wall panel
- The interior push button is mounted with screws on the exterior push button
- Visible screws

CONSTRUCTION TYPE 2
CK70-2, CK71-2, CK72-2



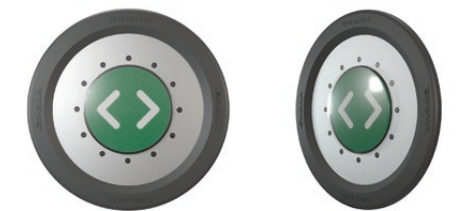
- Function: double-sided
- Application area: glass door
- The interior push button is mounted with screws on the exterior push button
- Visible screws

CONSTRUCTION TYPE 3
CK70-3, CK71-3, CK72-3



- Function: one-sided
- Application area: glass door
- Mounting from back side with cover housing
- Screws concealed

CONSTRUCTION TYPE 4
CK70-4, CK71-4, CK72-4



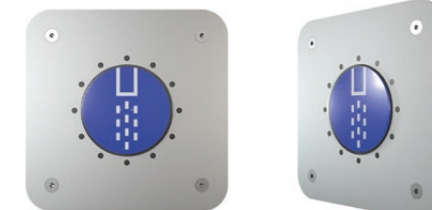
- Function: one-sided
- Application area: wall panel on buses and trains
- Installation from front side with Zentraflex mounting ring
- Screwless for flush installation

CONSTRUCTION TYPE 5
CK70-5, CK71-5, CK72-5



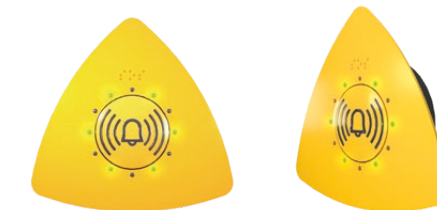
- Function: one-sided
- Application area: wall panel or door profile
- Installation from front side with back wall mounting using self-adjusting mounting claws
- Visible screws

CONSTRUCTION TYPE 6
CK82-F



- Function: one-sided
- Application area: interior and exterior
- Extremely shallow installation depth. Installation from front side with front panel
- Visible screws

SPECIAL CONSTRUCTION TYPE
(CFAD) CK92



- Function: one-sided
- EN 16683: CFAD = call for aid device
- Mounting from back side with cover housing/or installation from front side
- Screws concealed

CK WITH TOUCHLESS
FUNCTION



- Function: one-sided
- Application area: interior and exterior, especially suitable for lavatories
- Screws concealed
- Hybrid push button: tactile or contactless actuation



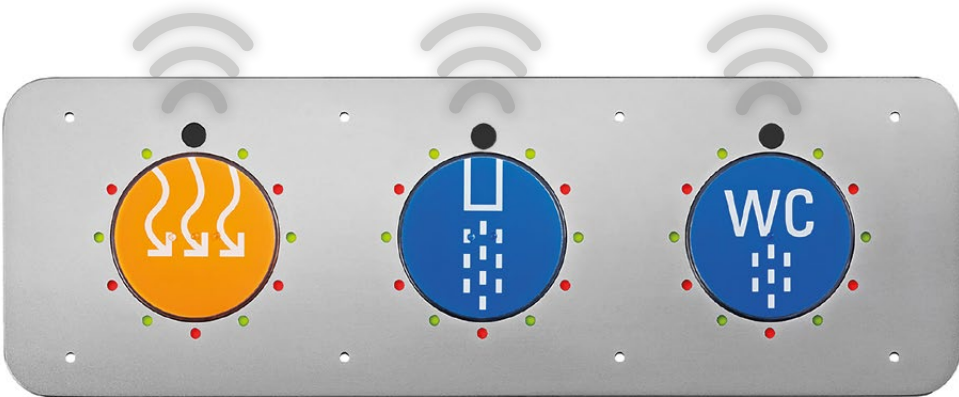
CK TOUCHLESS

TOUCHLESS AND TACTILE ACTIVATION

The CK Touchless was designed for applications in rail vehicles and can also be easily integrated into existing vehicles thanks to its simple installation. It offers a wide range of customized applications and is particularly suitable for use in lavatories and

other areas where hygiene and cleanliness cannot be guaranteed on a permanent basis. The use of touchless technology also improves passenger comfort and increases personal well-being when using public transportation.

- The push button can be operated touchlessly or tactilely depending on the situation
- Easy cleaning due to the flat design and the stainless steel front bezel
- Sensor technology: Increasing passenger comfort when operating public push buttons
- Customizable: wide range and combination possibilities of colors and pictograms
- Wide range of customized applications e.g. in lavatories or entry areas
- Complies with the current standards for rail vehicles (TSI-PRM, EN 14752, EN 16584-2, EN 50155, EN 45545-2 und EN 61373)



Nominal voltage	24 VDC
Nominal current	Depending on the version up to 50 mA @ 24 VDC
Switching current	200 mA ohmic load
Operating temperature	-25 ... +70 °C
Degree of protection	IP67 front and back side



COLOR AND PICTOGRAM VARIANTS

A COLORFUL SELECTION

The color of the front panel and the pictograms can be matched to your vehicle design. If the desired color or a motif of the pictogram is not available in our large selection, individual and special productionruns are also possible from a certain number of parts.

FRONT PANELS

The front panel is made of stainless steel and is powder-coated. Braille lettering is also possible. Here you will find a selection of colors.



PICTOGRAMS

TSL-ESCHA offers more than 160 pictograms for the CK pushbutton. Here we show you a small selection.



A complete overview of pictograms is available on our website.



Color selection of the stainless steel front bezel of the CK push button.

SEE AND HEAR

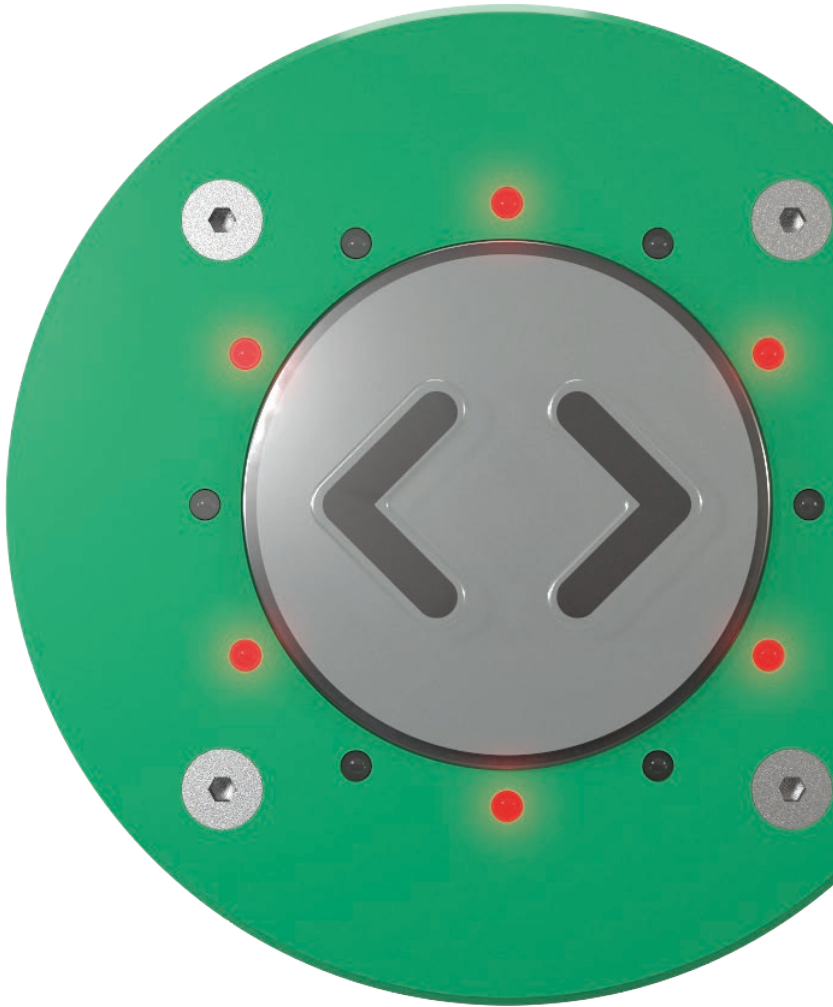
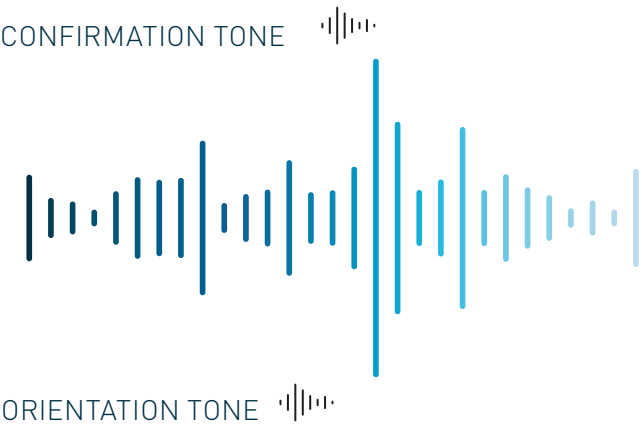
INDIVIDUAL PUSH BUTTON FUNCTIONS

The CK push button has a variety of individual light and sound signals.

- Configurable LEDs selectable
- LED displays can be controlled in groups
- Luminous colors: red, yellow, green
- Orientation, confirmation or warning tones
- Orientation tone and confirmation tone as continuous or intermittent tones

LIGHT SIGNALS

L0 No light signal 	L1 Six green LEDs 	L2 Six red LEDs 	L3 Six green LEDs Six red LEDs 	L1 Touchless Six green LEDs
L4 Twelve yellow LEDs 	L5 Twelve red LEDs 	L6 Twelve green LEDs 	L2 Touchless Five red LEDs 	



tone signal

Different acoustic variants can be selected for the CK push button for the actuated and non-actuated status.

Tone signal	Frequency	Duration	Interval	Functional duration	Description
A0	–	–	–	–	Without tone
A1	3,5 kHz	0,5 Sec.	0,5 Sec.	0,5 Sec.	Confirmation tone
A2	3,8 kHz	0,05 Sec.	2 Sec.	∞	Orientation tone

THE DETAILS

TECHNICAL DATA

SWITCHING PRINCIPLE

- Electromechanical short-stroke push button
- Overvoltage and reverse polarity protection
- Switching pulse length according to operation time or minimum pulse
- Operating force complies with TSI-PRM and EN 14752

SIGNALING

- twelve LED display
- LED displays can be controlled in groups
- Luminous colors red, yellow, green
- Orientation, confirmation or warning tones
- Orientation tone and confirmation tone as continuous or intermittent tones

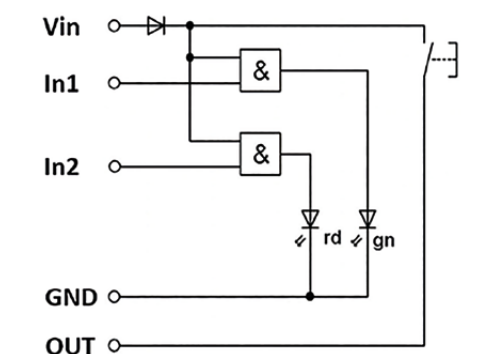
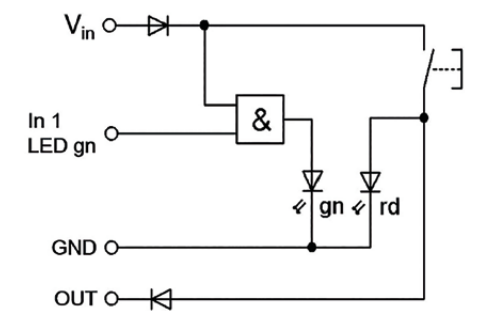
ELECTRICAL DATA

- Nominal voltage 24 VDC, 36 VDC, 72 VDC, 110 VDC
- Nominal current 45 mA @ 24 VDC
- Switching current Max. 50 mA and 200mA
- Switching function Normally open (NO), PNP

ENVIRONMENTAL CONDITIONS

- Switching cycles > 7 million
- Operating temperature -40 ... +80 °C
- Degree of protection IP67

CIRCUIT DIAGRAMS OF THE BASIC FUNCTIONS



Due to the modular design of the CK, the pictograms and the raised tactile surfaces can be combined individually.

Further technical details can be found in our checklist at www.tsl-escha.com.



TSL-ESCHA and MAFELEC offer customers a wide range of different push buttons.

MAFELEC TEAM LARGE VARIETY OF PUSH BUTTONS

The numerous possible combinations within the push button series result in an almost infinite variety of solutions for TSL-ESCHA and MAFELEC customers. Push buttons of the MAFELEC TEAM can be found everywhere on buses, trams, metros or trains. Whether on the exterior, interior or in the lavatories.

- Intuitive operation and clear recognition, even for passengers with restrictions thanks to touch surfaces and acoustic signals
- Designed for railway applications for public transport and accordingly conceived for harsh environments
- Developed to meet the market requirements of transport companies and the expectations of their passengers

TSL-ESCHA AND MAFELEC

OVERVIEW PUSH BUTTON SERIES

PK5x



- Large visible plane or tactile touch surface (Ø52 mm); tactile switching feel, with touchless option
- Invisible fastening elements, enhanced protection against manipulation by unauthorized persons
- Solid stainless steel or plastic bezel
- Versatile and individual parameter setting
- One- and double-sided function, suitable for glass doors (4-13 mm glass thickness)

PK2x



- Possibility of different switching functions, touch surfaces, mounting rings, LED colors and pictograms
- Eight construction types
- Hermetically sealed due to one-piece housing design
- Space-saving installation
- One- and double-sided function

M-DOOR GM



- No glass drilling, 3 to 20 mm glass thickness compatible
- Single or double-sided mounting
- No pairing, inside/outside buttons auto-synchronization
- Each LED area individually configurable
- M-Safe Touchless activation option

M-DOOR SINGLE



- Large illuminated area
- Haptic feedback
- Standard panel front or rear mounting
- Large customization, plastic or metal bezel and actuators, several schematics
- Orientation or confirmation tone

CK



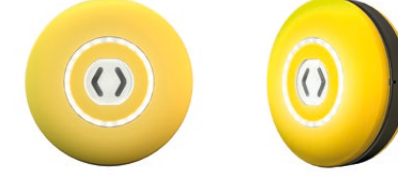
- Particularly flat design
- Seven construction types allow versatile use
- Robust stainless steel front bezel
- One- and double-sided function
- Optional: CK Touchless with contactless and tactile activation

MP



- Sealed, one-piece push button
- Smallest push button series of TSL-ESCHA
- Switches wear-free and withstands extreme conditions
- Selection of different colors for the inside ring and LED
- Often used in high speed trains

M-DOOR DOUBLE

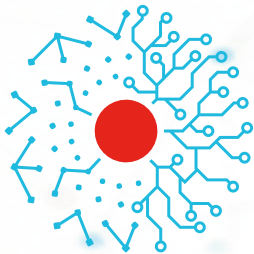


- Large illuminated area
- Single or double sided push buttons
- Easy and fast tool-free mounting
- Automatic glass thickness adaptation from 4 to 6 mm
- Large customization, plastic or metal bezel and actuators, several schematics

M-DOOR SLIM



- Slim ovale shape housing
- Wall or pole mounting Ø30 mm to Ø35 mm with 2 vandalproof screws
- Vertical or horizontal orientation
- Large customization, bezel color, plastic or metal actuator, several schematics
- Orientation and confirmation tone



MAFELEC TEAM

CREATING **TOGETHER** SMART AND SUSTAINABLE INTERFACES

HMI INTERIOR AND EXTERIOR

- DOOR EQUIPMENT
- PASSENGER COMFORT
- SANITARIES
- DRIVER DESK
- SAFETY SOLUTIONS

DETECTION & PROTECTION

- VOLTAGE & CURRENT SENSORS
- CIRCUIT BREAKERS
- INSULATORS AND BUSHINGS
- POWER SWITCHES

LIGHTING INTERIOR AND EXTERIOR

- FRONT LIGHTING
- INTERIOR LIGHTING
- EXTERIOR LIGHT SIGNATURE



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