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.
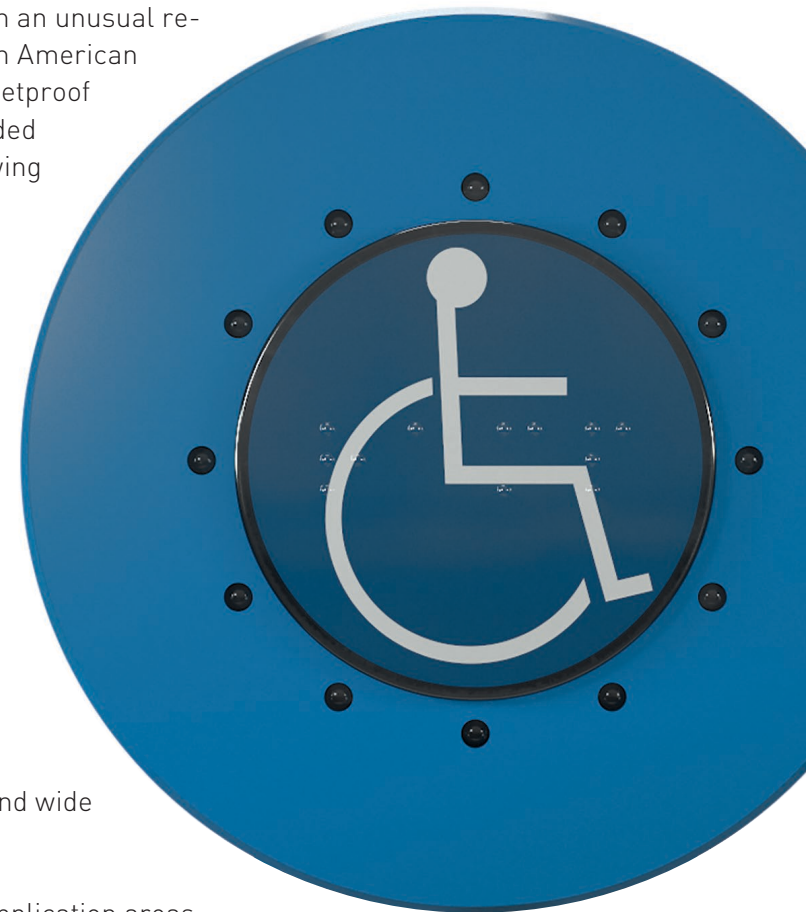
CONTENTS
CK PUSH BUTTONS

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 panel.

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. This ensures durable contrast and the color of the pictograms does not fade, which means the push buttons always look like new. 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 50155, EN 45545-2 and EN 61373) as well as the normative "durability of contrast" requirement according to the EN 16584-2 standard

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 of the two 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.

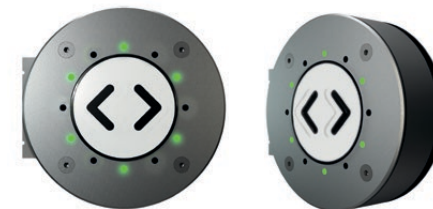More detailed information about dimensions can be found on our website.

CONSTRUCTION TYPE 1
CK70-1, CK71-1, CK72-1
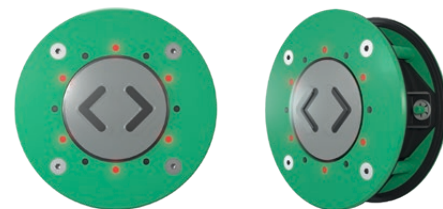
- Function: double-sided
- Application area: wall panel
- The interior push button is mounted with screws on the exterior push button
- Visible screws

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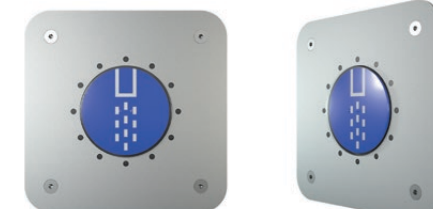
CONSTRUCTION TYPE 4
CK70-4, CK71-4, CK72-4

- 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

SPECIAL CONSTRUCTION TYPE (Touchless)
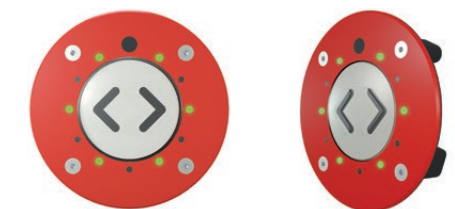
- Function: one-sided
- Application area: interior and exterior, especially suitable for lavatories
- Visible screws

NEW

CK TOUCHLESS
TOUCHLESS AND TACTILE ACTIVATION

TSL-ESCHA looks back on 35 years of experience in the development and production of push buttons. The focus is on the continuous development of products in order to realize holistic solutions to meet individual customer requirements. With the integration of touchless technology, TSL-ESCHA is expending its successful Combikey (CK) push button series and offers a product variation which additionally enables touchless activation of the push button.

The CK Touchless was designed for applications in rail vehicles and buses 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 CK Touchless is the first joint project between TSL-ESCHA and MAFELEC.

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 PANEL

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.

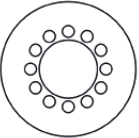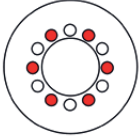**Color selection of the stainless steel front panel of the CK push button.**
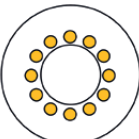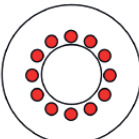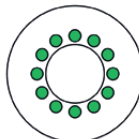
SEE AND HEAR
INDIVIDUAL PUSH BUTTON FUNCTIONS

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

- 12 configurable LEDs selectable

- LED displays can be controlled in groups

- Luminous colors: red, yellow, green

- Orientation, confirmation or warning tones (individually parameterized)

- Orientation tone and confirmation tone as continuous or intermittent tones

CONFIRMATION TONE

ORIENTATION TONE

LIGHT SIGNALS

L0
No light signal

L1
Six green LEDs

L2
Six red LEDs

L3
Six green LEDs
Six red LEDs

L4
Twelve yellow LEDs

L5
Twelve red LEDs

L6
Twelve green LEDs
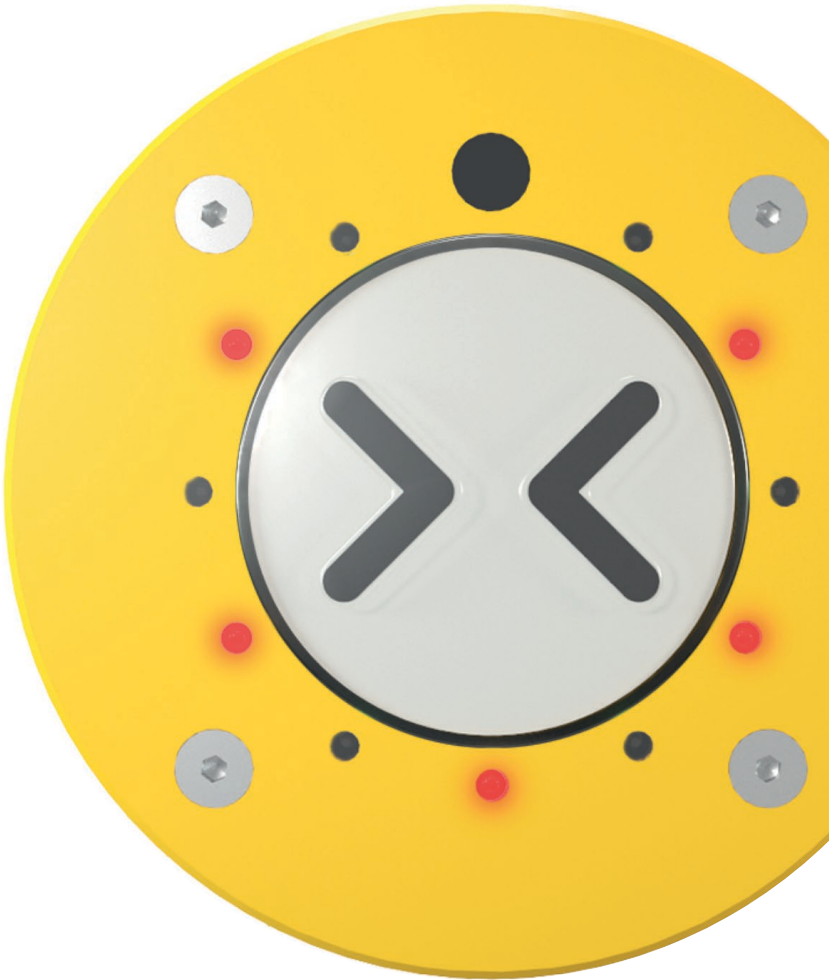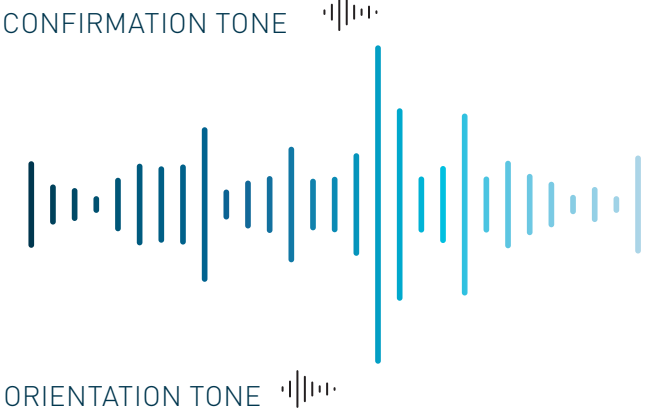
TONE SIGNAL

Different acoustic variants can be selected for the CK push button for the actuated and non-actuated status. Customers can also specify tone frequency, tone duration and interval.

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

THE DETAILS
TECHNICAL DATA

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

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 individually configurable LED displays
- LED displays can be controlled in groups
- Luminous colors red, yellow, green
- Orientation, confirmation or warning tones (individually parameterized)
- Orientation tone and confirmation tone as continuous or intermittent tones
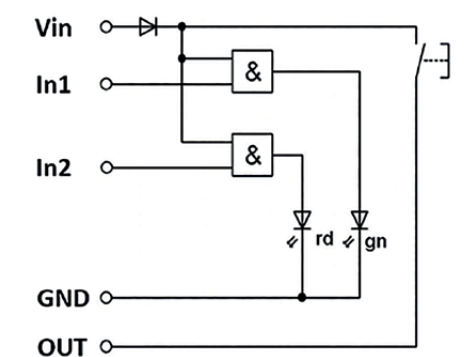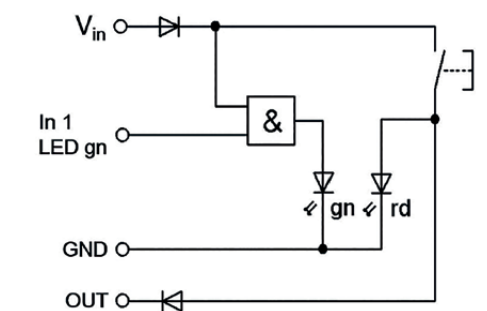
ELECTRICAL DATA

- 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 or NPN

ENVIRONMENTAL CONDITIONS

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

CIRCUIT DIAGRAMS OF THE BASIC FUNCTIONS

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

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

PK52

- Large active touch surface (Ø52 mm) with plane or tactile protection cap; tactile switching feel

- Invisible fastening elements, enhanced protection against manipulation by unauthorized persons

- Solid stainless steel or alternatively plastic bezel

- Versatile and individual parameter setting

- One- and double-sided functions, suitable for glass doors (4-14 mm glass thickness)

PK

- 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

PATENTED PRODUCT

- No glass drilling, compatible for 3 to 20 mm glass thickness

- Single or double-sided mounting

- No pairing, inside/outside buttons auto-synchronization

- Each LED area individually configurable

- M-Safe option in progress: touchless/antimicrobial surface

CK
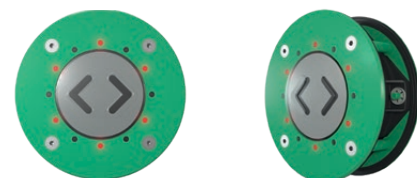
- Particularly flat design

- Seven construction types allow versatile use

- Robust stainless steel front panel

- Complies with durability of contrast of pictogram and front panel

- Tactile switching feel

- One- and double-sided functions

MP

- Sealed one-piece push button

- Smallest push button series of TSL-ESCHA

- Switches wear-free and withstanding extreme conditions

- Selection of different colors for the inside ring and LED

- Often used in high speed trains

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 function

M-DOOR DOUBLE
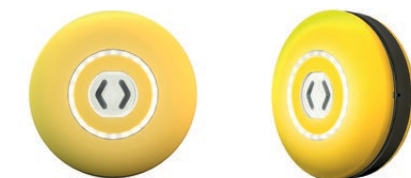
- Large illuminated area

- 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
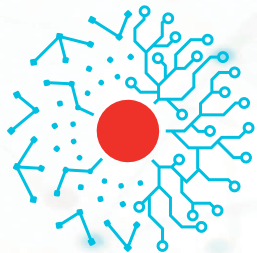
MAFELEC TEAM

CREATING 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

MAFELEC

MAFELEC
471, Route de la Cuisinière | 38490 Chimilin | France
T +33 4 763 207 33 | contact@mafelec.com
www.mafelec.com

TSL-ESCHA

TSL-ESCHA GmbH
Elberfelder Straße 1 | 58553 Halver | Germany
T +49 2353 66796-0 | info@tsl-escha.com
www.tsl-escha.com

MEMBERS OF THE MAFELEC TEAM

PETERCEM SWITCHES

STOPCIRCUIT

COMTRONIC

FULL ELECTRONIC SYSTEM

PETERCEM SENSORS

MAFELEC CHINA