

# **PK52 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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## PK52 PUSH BUTTONS

## PK52 SERIES

### INDIVIDUAL AND VERSATILE SETTING OF PARAMETERS

The PK52 push button of TSL stands out within the Presskey family in terms of its external features: an extremely large touch surface, very good lateral recognition of the status display and an acoustic orientation signal.

These are just a few examples that facilitate the awareness of TSL-ESCHA's PK52 push buttons and greatly simplify safe operation. Braille and self-explanatory pictograms also support tactile and visual recognition. The improved operational characteristics are particularly helpful for passengers with reduced mobility in buses and trains.

- Versatile, individual setting of parameters
- Large active touch surface
- Fast and easy to recognize
- Tactile switching feel
- Complies with the current standards for rail vehicles (TSI-PRM, EN 14752, EN 50155, EN 45545-2 and EN 61373)



Intuitive operation and clear recognition even for passengers with limited mobility.

In this manufacturing process of the PK52, the housing and the touch surface are ultrasonically welded.

## PK52 PUSH BUTTON CUSTOMIZED SOLUTION

The individual needs of door manufacturers and vehicle operators were also taken into account during development. Therefore, the PK52 is available in different variants. The most frequently selected version has a nominal voltage of 24 VDC with sound (2 to 5 kHz). A version with a nominal voltage of 12 to 24 VDC is available without sound.

Another variant of the PK52 can realize almost all functions and special requirements regarding light signals and sound signals (nominal voltage 24 to 110 VDC, with sound from 900 Hz to 5 kHz). All of these functions can be individually chosen and the necessary parameters be easily set thanks to the integrated micro-controller.

- Large active touch surface (Ø52 mm) with plane or tactile protection cap
- Invisible fastening elements, enhanced protection against manipulation by unauthorized persons
- Solid stainless steel or robust plastic bezel
- Double-sided variant for installation in glass doors (photo right)



Customized products can be configured using various functions.

# PK52 VARIANTS AT A GLANCE

## EVERY PUSH BUTTON A HIGHLIGHT

The PK52 push button series offers a great variety.

The PK52 push button of TSL is also available for the installation in glass doors of buses and trains. The new variant with a spacer ring that adapts to different door profiles is available with double-sided function and single-sided function with a blind cover. The PK52 can also be used as an emergency button, for example in lavatories, by combining it with a triangular plate. The TSL push button thus complies with the EN 16683 standard.

More detailed information about touch surfaces and LED variants as well as dimensions can be found on our website.



### CONSTRUCTION TYPE 1



- Function one-sided
- Application area: wall panel or door profil
- Screws covered by stainless steel front panel
- Stainless steel front bezel with text printing and/or Braille

### CONSTRUCTION TYPE 2



- Function double-sided
- Application area: glass door
- Mounting from front side in the back side cover housing
- The following angles are available for adapting the housing to the door profile slope: 0°/6°/10°/15°/25°

### CONSTRUCTION TYPE 3



- Function one-sided
- Application area: glass door
- Mounting of push button in the back side cover housing
- The following angles are available for adapting the housing to the door profile slope: 0°/6°/10°/15°/25°

### SPECIAL CONSTRUCTION TYPE (CFAD)



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

## VARIANT FOR GLASS DOORS VARIABLE INSTALLATION



TSL-ESCHA has developed a new double-sided version for the PK52 for installation in glass doors (Construction Type 2 and 3). The special highlight: Thanks to the movable cable cover, the new spacer ring can be easily adapted to different door profiles, thus compensating for tolerances and gap dimensions. The new design of the spacer ring facilitates assembly by pre-fixing the push button, as the outside push button is held by this element during installation. Inside and outside push buttons are connected to each other via an electrical interface. If necessary, the inside and outside push buttons can be exchanged separately.

- Cable cover available for five different door profiles (0°, 6°, 10°, 15°, 25°)
- The movable cable cover allows manufacturers to compensate for tolerances in the mounting cutout
- Standard glass thickness of 4-7 mm, even glass thicknesses of 8-13 mm possible as option
- Push button with one-sided function with a blind cover on the back instead of an inside push button



## VARIANT WITH PLASTIC BEZEL MORE DURABLE AND LIGHTER

Until now, TSL-ESCHA offered this bezel exclusively with powder-coated stainless steel. To meet the changing requirements, a bezel made of high-quality plastic material was designed. This means the operator can choose from a larger variety and, if desired, also replace the stainless steel bezel of the PK52 push button (from year of manufacture 2016 onwards) with one made of engineering plastic.

The new PK52 bezel is made of a modern material that convinces with its high level of precision and accuracy of fit. The front panel is easy to mount.

The plastic front panel is not intended for multiple use but is a wear and spare part that can be easily replaced. Delivery times can be kept short due to high availability of spare parts.

- Available in 8 standard colors
- High-quality appearance
- Easy to mount
- High resistance to cleaning chemicals and graffiti removers
- Weight reduction compared to stainless steel bezel (24 gram saved)



Detailed technical information can be found in the checklist.





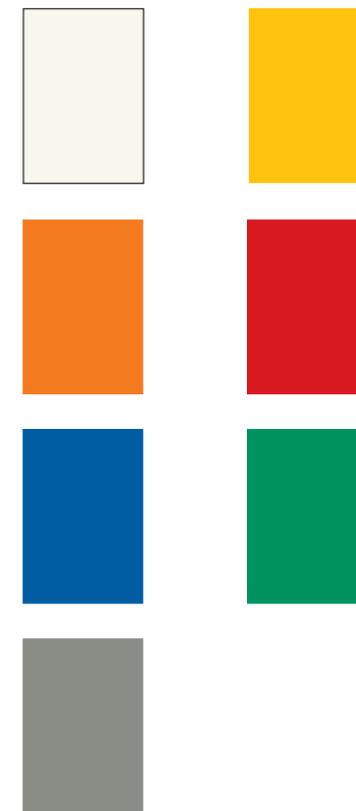
Many bright colors - here is the overview of the color selection for the new plastic front bezel.

## INDIVIDUAL COLOR AND PICTOGRAM SELECTION

The color of the bezel 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 custom-made products are also possible from a certain quantity.

### BEZEL

The bezel is available in stainless steel or plastic. Here is a selection of different colors. Braille and printing are also possible.



### PICTOGRAMS

TSL-ESCHA offers over 140 pictograms for the PK52. Here we show only a small selection. A complete overview is available on our website.



# SEE AND HEAR

## INDIVIDUAL PUSH BUTTON FUNCTIONS

The functions of the PK52 can be individually parameterized according to customer requirements. This is a combination of freely definable light signals, sound signals and additional control functions.

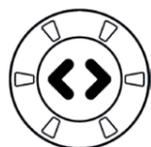
The PK52 has an integrated microprocessor in which the desired light and sound signals and the individual control functions are stored.

### LIGHT SIGNALS

The PK52 has a variety of individual light signals. With the light image combination L1 (release for actuation) and L2 (confirmation of activity), the light change complies with the requirements of EN 14752. The red LEDs can be replaced by yellow ones.

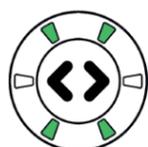
TSL also offers the additional function for the PK52 push button with a timer setting for the light signals, the so-called sandglass effect. When the door is released, the green LEDs light up. However, as soon as the push button is pressed, all red LEDs light up, which then turn off one after the other in a defined cycle. This happens while the gap bridging extends from the door to the platform and the door remains closed. Thus bridging the time between pushing the button and the opening of the door.

**L0**



**L1**

four green LEDs



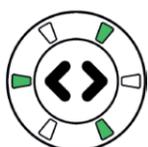
**L2**

six green LEDs



**L3**

three green LEDs



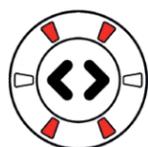
**L4**

two red LEDs



**L5**

four red LEDs



**L6**

six red LEDs



**L7**

three red LEDs



CONFIRMATION TONE



ORIENTATION TONE

### TONE SIGNALS

Different acoustic variants can be selected for the PK52 push button for the actuated and non-actuated state. Customers can also specify sound frequencies.

Tone signal A	Frequency	Duration	Interval	Description
A0	-	-	-	without tone
A1	3,5 kHz	0,5 Sec.	1 Hz	Confirmation tone
A2	3,8 kHz	0,05 Sec.	0,5 Hz	Orientation tone
AX	individual	individual	individual	-



PK52 pushbuttons meet the common standards for rail vehicles (EN 14752, EN 50155, EN 45545-2 and EN 61373) as well as the TSI-PRM and the normative requirement of "durability of contrast" (EN 16584-2).

## THE DETAILS

### TECHNICAL DATA

#### SWITCHING PRINCIPLE

- 3-point contact thanks to three micro buttons
- Tactile switching and tactile surfaces
- Operating force complies with TSI-PRM and EN 14752

#### SIGNALING

- 6 LED displays
- LED displays can be controlled in groups
- Luminous colors: red, green
- Orientation, confirmation or warning tones (individually parameterized)
- Orientation tone and confirmation tone as continuous or intermittent tones max. 53 dB(A)

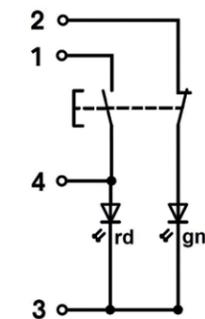
#### ELECTRICAL DATA

- Nominal voltage 12 ... 110 VDC, depending on the version
- Nominal current 50 mA @ 24 VDC, 110 mA @ 24 VDC with sound
- Switching current Max. 200 mA, depending on the version
- Switching function Normally open (NO), PNP or NPN, potential-free variant available

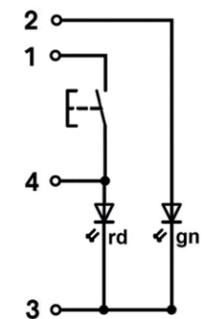
#### ENVIRONMENTAL CONDITIONS

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

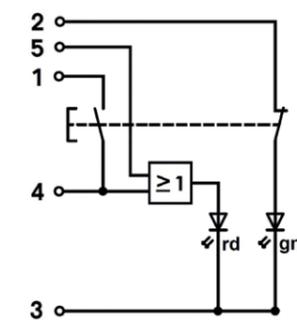
#### CIRCUIT DIAGRAMS OF THE BASIC FUNCTIONS



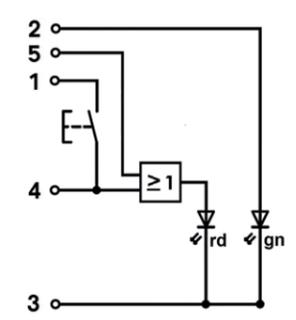
4 pole green off



4 pole



5 pole green off



5 pole



Further technical details on the probe assembly can be found in our checklist at [www.tsl-escha.com](http://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

### 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 VG



- Modern intuitive aesthetic lighting (VG = Vertical Green) for visually impaired people
- Haptic feedback
- Standard panel front mounting
- Large customization, plastic or metal bezel, plastic actuator, several schematics
- Good resistance to anti-graffiti removers

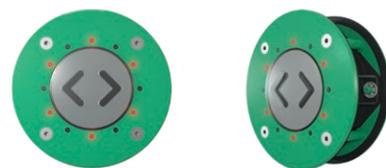
### M-DOOR GM



**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

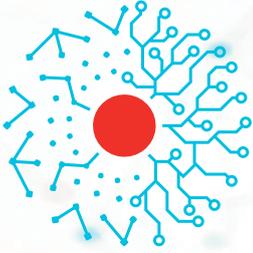


- Large illuminated area
- Haptic feedback
- Standard panel front or rear mounting
- Large customization, plastic or metal bezel and actuators, several schematics
- Orientation or confirmation tone function

### 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



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## MEMBERS OF THE MAFELEC TEAM

