



SOLUTIONS FOR LAVATORIES



MAFELEC AND TSL-ESCHA CREATING TOGETHER SMART AND SUSTAINABLE INTERFACES

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.

LAVATORIES IN THE TRAIN INSIDE AND OUTSIDE

MAFELEC and TSL-ESCHA stand for a wide product range of push buttons, LED lights, acoustic warning sounders and signal devices. By varying these products and through new developments, we can find customized solutions for every area of the lavatory.

Elements such as the indicator lights with matching pictograms ensure clear recognition while helping passengers quickly find the lavatories. A large choice of solutions is available within MAFELEC TEAM with different construction types and shapes, making it easy to find the right solution according to the mounting area and the requested aesthetics.

The train lavatory is often a rather small room. That is why space-saving products are also important when it comes to installation and assembly. For example, the CK series Emergency Call push button is a good choice as it is particularly flat. This means that it can also be used on thin walls. The X80 indicator light enables to display up to three different messages with one single product allows to save space.

Push buttons can be used to flush the toilet, call for aid, open and close the door and fulfil various functions at the sink of the lavatory, e.g. start the water flow, dispense soap or start the hand dryer. A perfect solution for this is a panel equipped with MP or CK push buttons, for example. The advantage here is the simple and quick mounting. A rear mounted M-Door could also be a suitable solution for a panel integration. All push buttons have a degree of protection IP67, making them ideal for use in lavatories

Built-in spotlights and the PL14 linear light, which can be attached to the mirror, for example, are ideal for lighting the train's lavatories.

In order to ensure the proper functioning of the toilets, it is important that the services on board quickly see the water level. That's the purpose of the water level indicator, that can be fully customized.



PRODUCT OVERVIEW



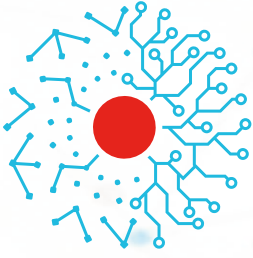
Push Buttons	PK5x	PK2x	CK	CK92/PK5x (Emergency Call)	MP Panel	M-Door Single	M-Door Slim	M-Door Single/RMS
Nominal or operating voltage	12 ... 110 VDC (depending on version)	24, 36, 72, 110 VDC	24, 36, 72, 110 VDC	24, 36, 72, 110 VDC	24, 36, 72, 110 VDC	12, 24, 36, 72, 110 VDC	12, 24, 36, 72, 110 VDC	12, 24, 36, 72, 110 VDC
Operating temperature	-40 ... +80 °C	-40 ... +80 °C	-40 ... +80 °C	-40 ... +80 °C	-40 ... +80 °C	-40 ... +85 °C	-40 ... +85 °C	-40 ... +85 °C
Degree of protection	IP67	IP67	IP67	IP67	IP67	IP67	IP67	IP67/IP65
Configurable: color, LEDs, light and sound signals, pictograms	yes	yes	yes	according to DIN EN 16683	yes	yes	yes	yes
Resistance to cleaning chemicals	yes	yes	yes	yes	yes	yes	yes	yes
Function double-sided	yes	yes	yes	no	no	yes	no	no
Touchless option	yes	no	yes	yes	no	no	no	no
Material front bezel	plastic	plastic	stainless steel	plastic	plastic	plastic, metal	plastic	-
Range of application	door, flush, sink	door, flush, sink	door, flush, sink	call for aid push button according to DIN EN 16683	sink	door, flush, sink, call for aid push button according to DIN EN 16683	door, flush, sink	sink

Indicator Lights	ML52	ML64	PKM52	M-Door Single	M-Door SLIM	X80	Water Level
Nominal voltage	24 VDC	12 ... 110 VDC	24 VDC	12, 24, 36, 72, 110 VDC	12, 24, 36, 72, 110 VDC	24, 72 VDC	110 VAC
Operating temperature	-40 ... +50 °C	-40 ... +60 °C	-40 ... +80 °C	-40 ... +85 °C	-40 ... +85 °C	-25°C ...+70°C	-25°C ...+70°C
Degree of protection	IP67	IP44	IP67	IP67	IP67	IP40	IP54
Display window	polycarbonate	polycarbonate	polycarbonate	polycarbonate	polycarbonate	polycarbonate	polycarbonate
Backlighting	red, red and green	red	red	red, yellow, green, blue, amber, white	red, yellow, green, blue, amber, white	red, green, amber, white	red
Mounting	front	front	front or back side	front or back side	front or pole	back side	front
Special feature	optional signal tone matching the visual display	flat design	high-quality stainless steel front panel	text and pictogram with disappearing effect	low width	up to three indications in the same product	stainless steel plate



Sounders	WM87/WSM87	SM87
Operating voltage	24 ... 110 VDC	24 ... 110 VDC
Operating temperature	-40 ... +80 °C	-40 ... +80 °C
Degree of protection	IP67	IP20
Dimension	Ø87 or 100	58 x 58 x 28
Sound level	up to 80 dB(A)	depending on installation
Sound level adjustment	yes	yes
Parameterization on site	yes	yes
Material front cover	stainless steel	plastic

LED Lights	EL50	PL14M
Nominal or operating voltage	24 ... 36 VDC or 110 VDC	24 VDC
Operating temperature	-40 ... +50 °C	-40 ... +60 °C
Degree of protection	IP67	IP67
Luminous color	white	white
Housing material	aluminum	aluminum
Front panel material	stainless steel	-
Cover material	glass	glass
High resistance to cleaning chemicals	yes	yes
Range of application	ceiling	mirror, ceiling



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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MEMBERS OF THE MAFELEC TEAM

