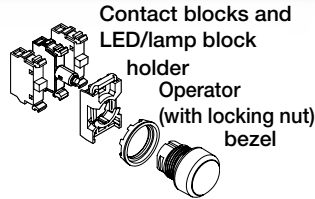


## Flush and extended pushbuttons Illuminated, momentary and maintained

### How to order:

- Alt.1** • Operator  
+ holder  
+ Contact block(s)  
+ LED/lamp block

- Alt.2** • Operator  
+ holder with contact block(s)  
and lamp block



NOTE: No contact block in center position, reserved for lamp block

NOTE: For contact blocks, holders & LED lamp blocks, see Accessories pages 7.25 - 7.30.

### Bezel - How to order

Black plastic - Standard

Chrome plastic - Replace '1' with '2' in Catalog number

Chrome metal - Replace '1' with '3' in Catalog number



Bezel options	Catalog number
Black plastic	MPX-11X
Chrome metal	MPX-31X

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Illuminated flush pushbutton  
with black plastic bezel

### Operator: pushbutton

Description	Catalog number	Weight oz.
<b>Flush pushbutton (light bulb max 2 W, not included)</b>		
<b>Momentary</b>		
Red	MP1-11R	0.56
Green	MP1-11G	0.56
Yellow	MP1-11Y	0.56
Blue	MP1-11L	0.56
White	MP1-11W	0.56
Clear	MP1-11C	0.56
<b>Maintained</b>		
Red	MP2-11R	0.56
Green	MP2-11G	0.56
Yellow	MP2-11Y	0.56
Blue	MP2-11L	0.56
White	MP2-11W	0.56
Clear	MP2-11C	0.56

### Extended pushbutton (light bulb max 2 W, not included)

<b>Momentary</b>		
Red	MP3-11R	0.56
Green	MP3-11G	0.56
Yellow	MP3-11Y	0.56
Blue	MP3-11L	0.56
White	MP3-11W	0.56
Clear	MP3-11C	0.56
<b>Maintained</b>		
Red	MP4-11R	0.56
Green	MP4-11G	0.56
Yellow	MP4-11Y	0.56
Blue	MP4-11L	0.56
White	MP4-11W	0.56
Clear	MP4-11C	0.56



Illuminated extended push- button with  
black plastic bezel

## Technical data

### Standards and approvals

IEC / EN 60947-1	Low-Voltage Switchgear and Controlgear - Part 1: General rules
IEC / EN 60947-5-1	Low-Voltage Switchgear and Controlgear - Part 5-1: Control circuit devices and switching elements - Electromechanical control circuit devices
IEC / EN 60947-5-5	Low-Voltage Switchgear and Controlgear - Part 5-5: Control circuit devices and switching elements - Electrical Emergency Stop device with mechanical latching function
IEC / EN 60073	Basic and safety principles for man-machine interface, marking and identification - Coding principles for indicators and actuators
IEC / EN 60529	Degrees of Protection provided by enclosures (IP code)
EN 50013	Low-Voltage Switchgear and Controlgear for industrial use - Terminal marking and distinctive number for particular control switches
DIN 40050-9	Road vehicles; Degrees of Protection (IP-code); protection against foreign objects; water and contact; electrical equipment
UL 508	Industrial Control Equipment
CSA C22.2 No 14	Industrial Control Equipment

### Environmental data

#### Degrees of protection

Operators	IEC/EN DIN	UL/CSA
Pushbutton: MP *	IP66	Catalog number 1, 3R, 4, 4X, 12, 13
Double pushbutton: MPD *	IP66	Catalog number 1, 3R, 4, 4X, 12, 13
Mushroom pushbutton: MPM *	IP66	Catalog number 1, 3R, 4, 4X, 12, 13
Emergency Stop: MPMT/P *	IP66	Catalog number 1, 3R, 4, 4X, 12, 13
Selector Switch: M2SS/M3SS *	IP66	Catalog number 1, 3R, 4, 4X, 12, 13
Key-operated Selector Switch: M2SSK/M3SSK *	IP66	Catalog number 1, 3R, 4, 4X, 12
Toggle Switch: MTS2/MTS3 *	IP66	Catalog number 1, 3R, 4, 4X, 12, 13
Extreme Duty pushbutton: KP6	-	Catalog number 1, 3R, 4, 4X
Reset pushbutton: KPR *	IP 66	Catalog number 1, 3R, 4, 4X, 12, 13
Joystick: MJS	IP66, 67, 69K	Catalog number 1, 4X (indoor), 12, 13
Pilot lights: ML	IP66	Catalog number 1, 3R, 4, 4X, 12, 13
Buzzer: KB	IP65	Catalog number 4X
Potentiometer: KT *	IP66	Catalog number 1, 3R, 4, 4X, 12, 13
Contact block and Transformer block	IP20	-
Plastic Enclosures	IP66	Catalog number 1, 3R, 4, 4X, 12, 13
Metallic Enclosures	IP66, 67, 69K	-

#### Temperature

Ambient temperature during operation	-25 to +70 °C
Storage temperature	-40 to +85 °C

\* With Chrome plastic bezel IP66 Catalog number 1, 12, 13

Please note that specified degree of protection is for operator mounted on panel. If other items are mounted in between, please make sure that they are correctly sealed.

### Technical Data

#### Terminals

Plus-minus Pozidriv No.2 screw with DIN-washer.

Connectable Area	min. 1 x 0.5 mm <sup>2</sup> /AWG 20 max. 2 x 2.5 mm <sup>2</sup> /2 x AWG14
Tightening Torque	
Operators Locking Nut	Min. 2 Nm / Max. 2.3 Nm
Cable Terminals	0.9 Nm

#### Material

No ozone depleting substances in the products.

All front of panel plastic components are made of polycarbonate

PC Polycarbonate	High impact strength, good outdoor resistance. Chemical resistance (see table below)
PSU Polysulphone	Can withstand high temperatures, acids, basic solutions, alkaline compounds, oils, alcohols.
PA Polyamide	Can withstand high temperatures, aliphatic, aromatic and chlorinated hydrocarbons, esters, ketone-aldehydes, alcohols and basic solutions.
PBT	Can withstand high temperature, aliphatic and aromatic hydrocarbons, acids, basic solutions, alcohols, grease and oils
Zinc	Good corrosion resistance in inland-, sea and industrial atmosphere.
light-alloy	Good corrosion resistance in inland-, sea and industrial atmosphere.

#### Chemical Resistance for Polycarbonate

Chemical Class	Effects
Acids	No significant effect under most typical conditions of concentration and temperature
Alcohols and Alkalis	Generally compatible at low concentration and room temperature. Higher concentrations and elevated temperatures can result in etching and attack evidenced by decomposition.
Aliphatic Hydrocarbons	Generally compatible
Amines	Surface crystallization and chemical attack. Avoid.
Aromatic Hydrocarbons	Partial solvents and severe stress cracking agents (i.e., xylene, toluene). Avoid.
Detergents and Cleaners	Mild soap solutions are generally compatible. Strong alkaline materials should be avoided.
Esters	Cause severe crystallization. Partial solvents. Avoid.
Greases and Oils	Pure petroleum Catalog numbers generally compatible. Many additives used with them are not.
Halogenated Hydrocarbons	Solvents. Avoid.
Ketones	Cause severe crystallization and stress cracking. Partial solvents. Avoid.
Silicone Oil and Greases	Generally compatible up to 85 °C.



### Approvals

The pushbuttons, selector switches and pilot lights are approved by:  
- National approval agencies: UL, CSA and China Compulsory Product Certification

For detail information please contact ABB

## Technical data

### Electrical data

#### Standard contact blocks

Self cleaning silver contacts, NC contact with positive opening. At voltages and currents below 24 V and 5.6 mA we recommend our Micro Switch blocks.

#### Ratings as per IEC 60947-5-1

Rated Insulation Voltage, $U_i$		690 V	
Rated Thermal Current, $I_{th}$		10 A	
Rated Operational Current, $I_e$ Utilization category AC 15,	at: 120 V at: 230 V at: 400 V at: 690 V	8 A 6 A 4 A 2 A	
Rated Operational Current, $I_e$ utilisation category DC 13,	at: 24 V at: 125 V at: 250 V	5 A 1.1 A 0.55 A	

#### Ratings as per UL, CSA, NEMA

		A600 AC		Q600 DC
Rated Insulation Voltage		600 V		600 V
Rated Thermal Current		10 A		2.5 A
Rated Operational Current	at: 120 V at: 240 V at: 480 V at: 600 V	6 A 3 A 1.5 A 1.2 A	at: 125 V at: 250 V at: 480 V at: 600 V	0.55 A 0.27 A 0.10 A 0.10 A

**Contact resistance** < 25 mΩ

**Compulsory function test** at: 5V, 16 mA

#### Max. number of contact blocks per operator

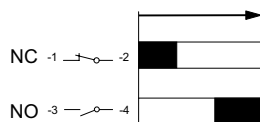
The Contact blocks can be stacked in max two levels on the 3- block holder. Only one level is accepted on the 5-block holder.

pushbutton, Toggle Switch, Mushroom pushbutton, Double pushbutton, Selector Switch, Key-operated Selector Switch and Emergency Stop Operator	6
Joystick	8

### Short circuit protection

Max. fuse at 1 kA | gG 16A

#### Diagram for make-and-break contact



#### Micro Switch block / Ratings as per IEC 60947-5-1

Rated Insulation Voltage, $U_i$		125 V
Rated Thermal Current, $I_{th}$		3 A
Rated Operational Current, $I_e$ utilisation category AC 14,	at: 125 V	0.5 A
Rated Operational Current, $I_e$ utilization category DC 13,	at: 24 V	0.3 A
Rated Operational Current, $I_e$ utilization category DC 12,	at: 24 V	0.1 A

#### Minimum Switching Capacity

Standard Contact blocks	24 V DC	5.6 mA
Gold plated Contact blocks	5 V DC	12 mA
	12 V DC	1 mA
Micro Switch blocks	3 V DC	1 mA

#### Ratings as per UL 508

	125 V AC	3 A
	60 V DC	0.2 A
	48 V DC	0.1 A

### Mechanical data

#### Mechanical life

Standard Contact blocks		10 million operations
pushbuttons, Momentary Mushroom pushbutton		2 million operations
Selector Switches Present standard (no operation of center contact)		500 000 operations
With operation of center contact		250 000 operations
		150 000 operations
Maintained Mushroom pushbutton, Key-operated Selector Switch and Double pushbutton		500 000 operations
Emergency Stop		100 000 operations
Toggle Switch		1 million operations
Joystick		500 000 operations
		400 000 operations
		300 000 operations

## Technical data

### Lamp block ratings as per IEC 60 947-5-1

Rated Insulation Voltage	230 V
Base	BA 9s
Permissible power, up to	2 W

### Transformer block

Suitable for Filament bulb 6 or 24 V AC, 1.2 W and LED 24 V.	
Rated Power	1.5 W
Rated Insulation Voltage acc. to IEC 70 °C (DT)	Class E

### LED bulbs

Service Life for LED bulbs means number of service hours until the brightness has been reduced down 50 %. Service Life 50 000 h	
Color of white LED	x=0.31 Y=0.32 means the position of color in the ICI Chromaticity Diagram
Voltage Tolerance on LED bulbs	-30 to +10 % voltage is acceptable without affecting the Service Life
Voltage Peaks on LED bulbs	Voltage Peaks up to 1000 V Current Peaks up to 500 mA during a few msec
Glowing light	All integrated LED bulbs have a function built in to cut leakage currents.