

MP Series two-step momentary pushbutton switches with optical barrier contacts are designed for control of two-speed motors.

❑ **SIL2**

Safety Integrity Level (SIL2) is a safety level defined by the IEC 61508 standard, corresponding to a high protection level for the equipment, production and employees.

The electrical and mechanical redundancy of MP pushbuttons are ensured by :

- redundant optical contacts for each active position,
- two mechanical systems (a membrane and two springs).

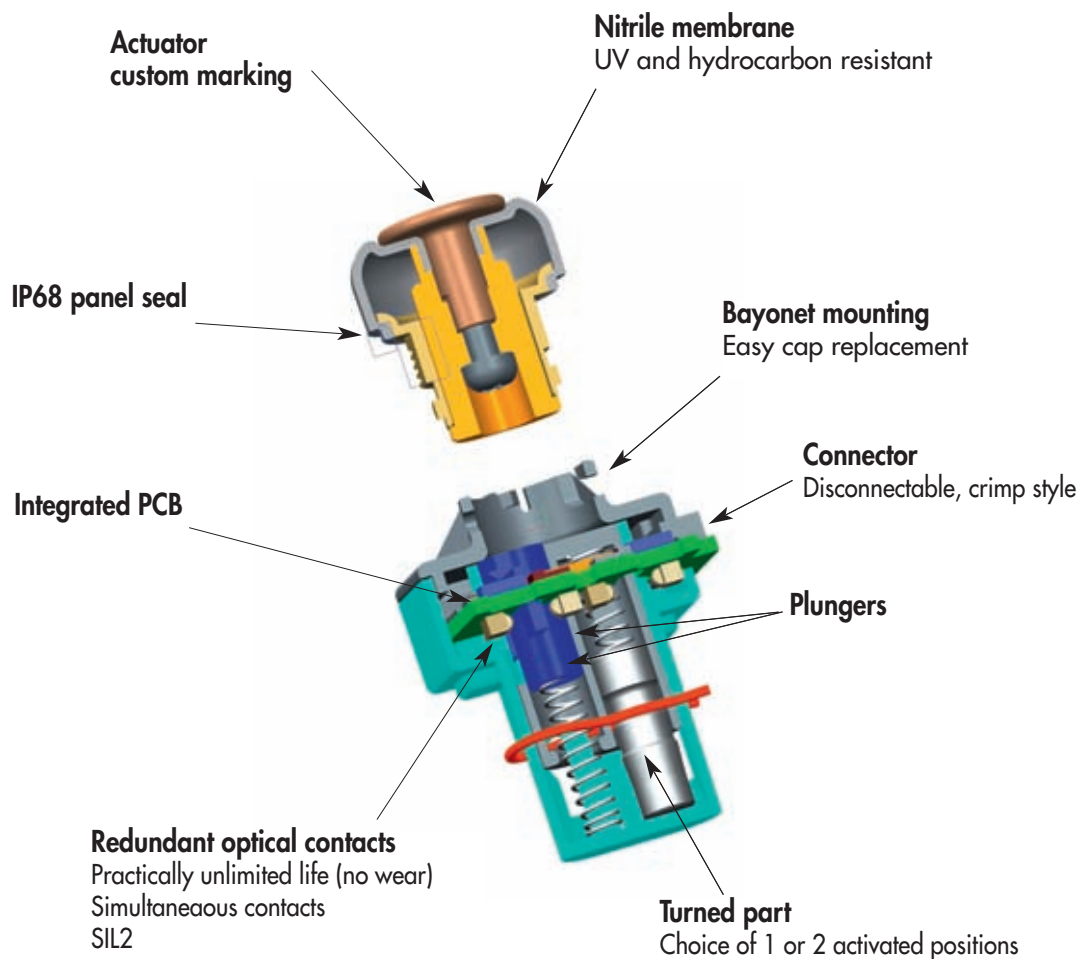
In case of mechanical or electrical failure, the pushbutton will provide a low logic signal if the equipment control system is programmed to verify output activation state.

❑ **Easy to integrate**

Disconnectable crimp style connector. The PCB is integrated in the switch.

❑ **Resistant to harsh environments**

IP68 front panel sealing and a nitrile membrane resistant to UV and hydrocarbons make MP pushbuttons ideal for harsh environment applications.



New!

- SIL 2
- Easy to integrate
- Sealed to IP68
- UV and hydrocarbon resistant

ELECTRICAL AND GENERAL SPECIFICATIONS

- Current/voltage rating : 20mA 5VDC max. / 3,3VDC min.
- Idling current : 20 to 80mA 5VDC - 11 to 44mA 3,3VDC`
- NPN output signal : 20mA with 12VDC max. commutation voltage
- Operating force :
 - step 1 : 11,5N ± 1,5N
 - step 2 : 14,5N ± 1,5N
- Travel :
 - 1 step : 4 mm ± 0,4 mm
 - 2 steps : 6,65 mm ± 0,4 mm
- Mechanical life expectancy : 1 million cycles on each position

MATERIALS

- Case + plungers : POM
- Bezel membrane : UV and hydrocarbon resistant nitrile
- Bushing + actuator : polyamide 6/6
- Connector : disconnectable crimp-style JST SM09B-SRSS-TB

Note : mating connector JST09SR-3S

ENVIRONMENTAL SPECIFICATIONS

- SIL 2 according to IEC 61508
- Sealing to IP68 according to IEC 529
- Operating temperature : -20°C to +70°C
- Static resistance : 10KV

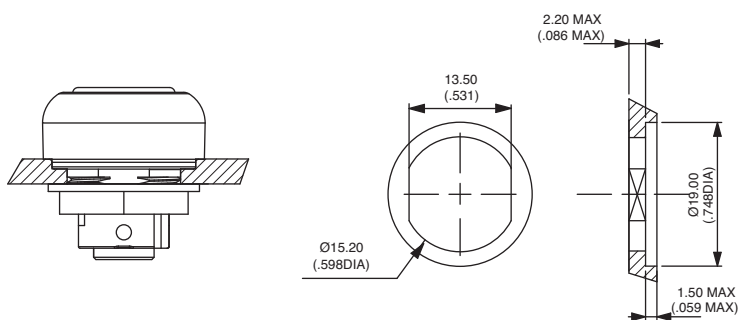
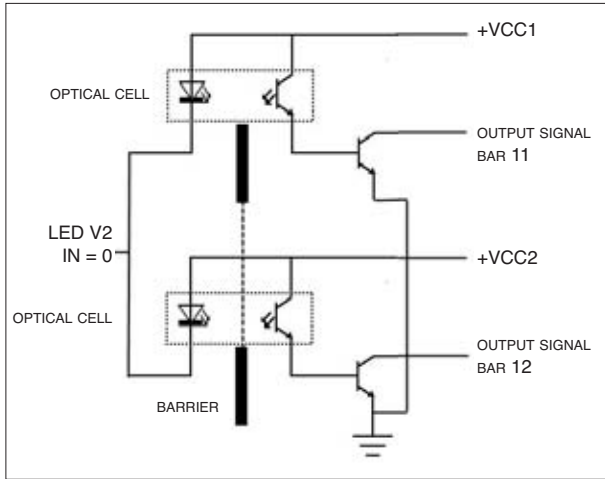
PANEL CUT-OUT & RECOMMENDED MOUNTING

Diagram of an optical barrier redundant in position 1



MP pushbutton switches feature two active positions.

Each position is activated by redundant optical contacts.

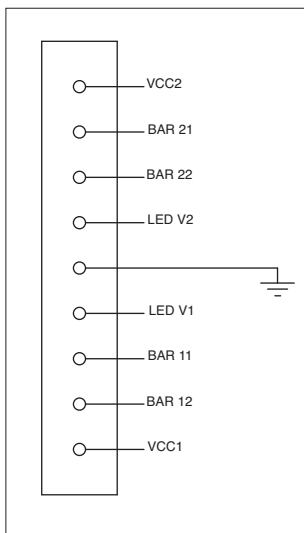
The redundant barriers have separate power supplies.

The output signal is equivalent to a NPN output signal.



The load should be connected between VCC and Output Signal Bar

Wiring diagram for connector JST SM09B-SRSS-TB

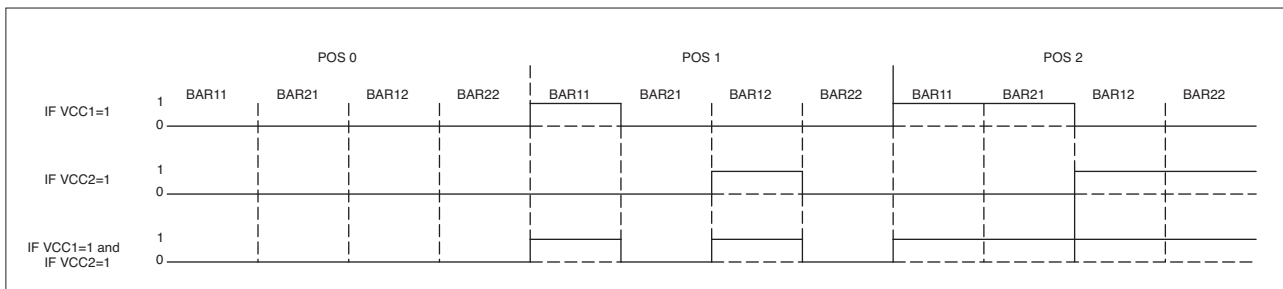


BAR 11 = output signal of step 1
 BAR 12 = output signal of step 1
 BAR 21 = output signal of step 2
 BAR 22 = output signal of step 2

VCC1 supplies the optical barriers with BAR 11 and BAR 21 outputs.
 VCC2 supplies the optical barriers with BAR 12 and BAR 22 outputs.

Optical cell inputs LED V2 and LED V1 are at zero.

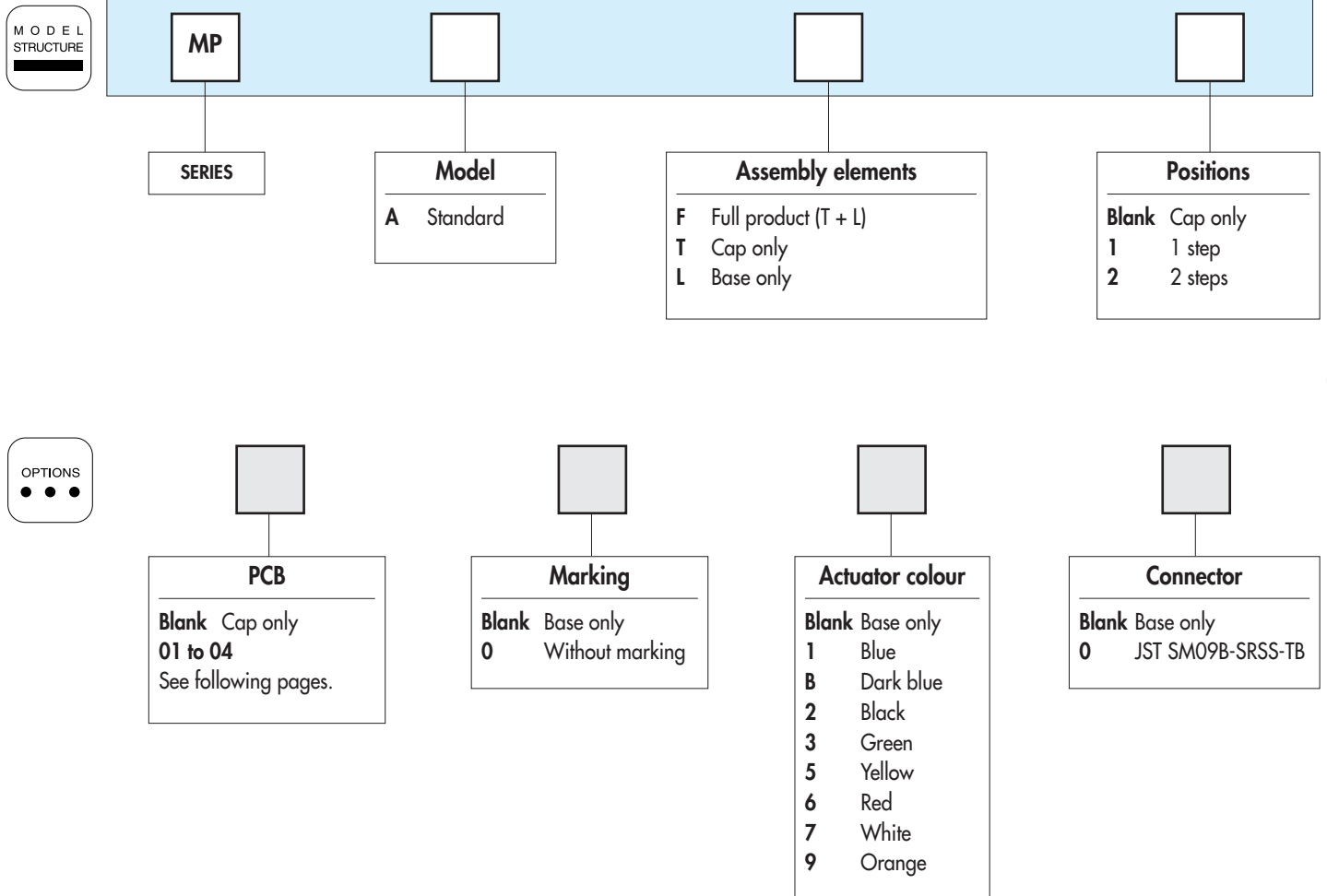
Activation state of optical cells



Note : MP pushbutton switches can be used in low power mode. Please contact APEM.



New!



B2

ABOUT THIS SERIES

On the following pages, you will find successively :
model structure of switches and options in the same order as in above chart

Dimensions : first dimensions are in mm while inches are shown as bracketed numbers.



NOTICE : please note that not all combinations of above numbers are available.
Refer to the following pages for further information.



Packaging unit : 25 pieces



www.ermec.com

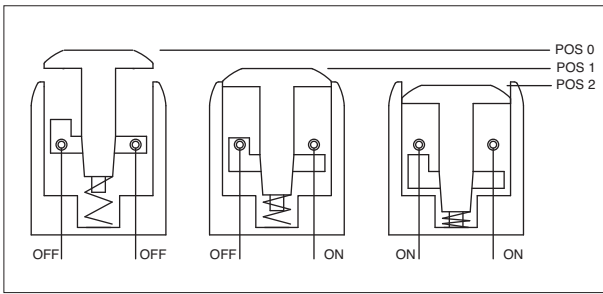
MP series

Two-step pushbutton switches

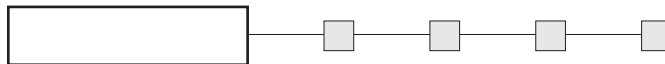
ermec@ermec.com

ME L
STRUCTURE

New!



MODEL
STRUCTURE



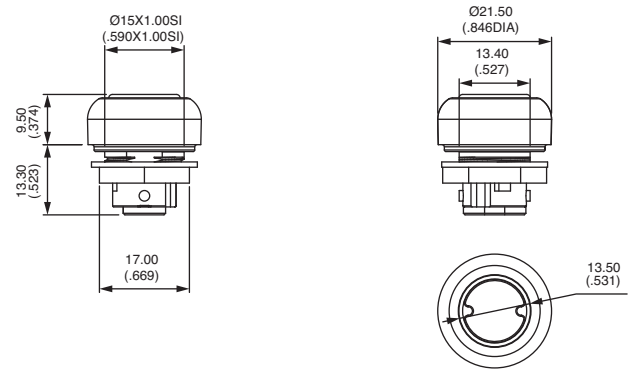
B2

Cap only



MPAT

Add desired actuator colour (see options).

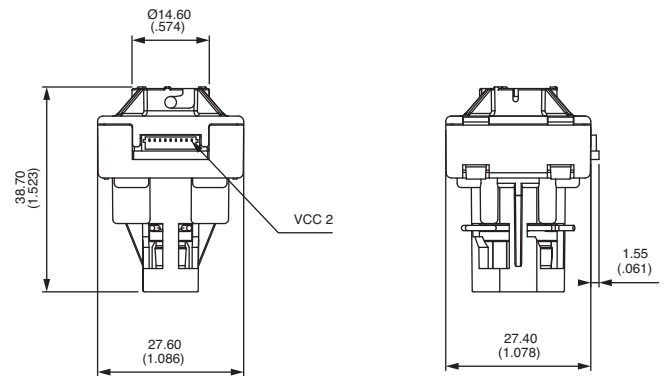


Switch base only



MPAL

Add desired PCB (see options).



Full product

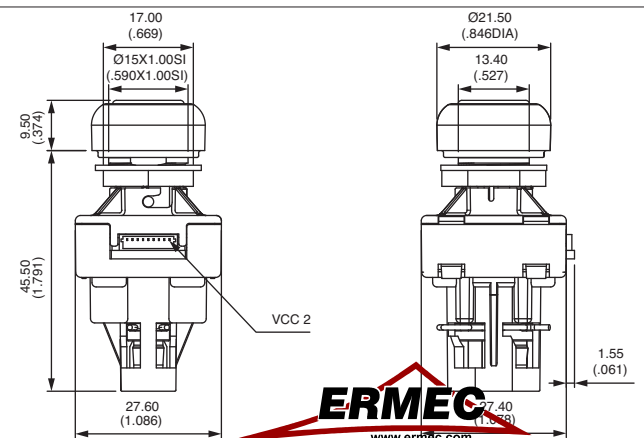


One-step switch
MPAF1

OFF MOM

Two-step switch
MPAF2

OFF MOM MOM



www.ermec.com



New!

PCB



Blank Cap only

	No of barriers	No of steps	Contact Redundancy
01	4	2	yes
02	2	1	yes
03	2	2	no
04	1	1	no

MARKING



Blank Base only

0 Without marking

ACTUATOR COLOUR



Blank Base only

- 1** blue
- B** dark blue
- 2** black
- 3** green
- 5** yellow
- 6** red
- 7** white
- 9** orange

CONNECTOR



Blank Cap only

0 JST SM09B-SRSS-TB











Selection guide - Section B2 ermec@ermec.com

Pushbutton switches

								
Series	ZP	SMT TP	TP	9500	PHAP40	SP	8000	9400/9600
Page	B2-2	B2-4	B2-6	B2-12	B2-20	B2-22	B2-28	B2-34
Poles	1	1	1,2	1	2	1,2	1,2	1
Maximum current	500mA 48VDC	0,4VA 20V AC/DC	0,5A 48V AC/DC	100mA 30VDC	100mA 30VDC	1A 30VDC	(3A 250VAC)* 4A 30VDC	1A 30VDC
Bushing dimension								
Ø4 (.157)				X				
Ø4,83 (10-48)	X							
Ø6,35 (1/4)						X	X	X
Ø11,9 (15/32)							X	
Ø16 (.629)								X
Mounting options								
Horizontal SMT		X						
Vertical right angle SMT		X						
Vertical Through hole	X		X	X	X	X	X	X
Horizontal Through hole			X			X	X	
Vert. right angle Thr. hole			X	X		X		
Panel	X			X		X	X	X
Terminal options								
PCB	X	X	X	X	X	X	X	X
Solder lugs	X			X			X	X
Quick-connect								X
Sealing	No	Process	Process	Optional	No	Process	Optional	Optional


() * See applicable approvals

								
Series	10400	13000	13000X778	18000	IT	1200	1400	4700/4800
Page	B2-42	B2-44	B2-52	B2-63	see website	B2-107	B-114	B-117
Poles	1,2	1,2	2	1,2	2	1	1	1,2
Maximum current	3A 24VDC	4A 30VDC *2A 250VAC)*	4A 30VDC	7A 30VDC	1,5A 250VAC	(4A 250VAC)* 4A 24VDC	6A 12VDC	(3A 250VAC)*
Bushing dimension								
Ø6,35 (1/4)		X		X				
Ø10 (.393)	X							
Ø11,9 (15/32)		X	X					
Ø 12 (.472)						X		X
Mounting options								
Vertical Through hole		X	X	X			X	X
Horizontal Through hole		X		X	X			
Vert. right angle Through hole				X				
Panel	X	X	X	X		X	X	X
Snap-in				X			X	
Terminal options								
PCB		X	X	X				
Solder lugs	X	X	X	X		X		X
Quick-connect						X		X
Screw						X		
Sealing	No	Optional	IP67	No	No	No	No	No



Selection guide - Section B2 ermec@ermec.com

Pushbutton switches

	<i>New!</i> 	<i>New!</i> 		<i>New!</i> 	<i>New!</i> 			
Series	CG	CP	PBA	FP	MP	LPI		
Page	B2-120	B2-125	B2-129	B2-145	B2-150	B2-156		
Poles	1 NPN	1 NPN	1	1,2	1,2	1		
Maximum current	200mA 24VDC	200mA 24VDC	1A 24VDC	200mA 12VDC	20mA 5VDC	5A 12VDC 100mA 12VDC		
Illuminated	X	X	X	X		X		
Bushing dimension								
Ø15,20 (.598)					X			
Ø16 (.629)		X	X					
Ø19 (.748)		X	X					
Ø22 (.866)		X	X					
Ø24 (.944)				X				
Ø38 (1.496)						X		
Ø44 (1.732)						X		
Mounting options								
Panel	X	X	X	X	X	X		
Terminal options								
Solder lugs				X				
Screw						X		
Flying leads		X	X					
Cable		X	X	X				
Connector	X	X			X			
Sealing	N/A	IP68, IP69K	IP68,IP69K	No	IP68	IP53		

«|» range selection guide : page 7
 AV series selection guide : page 10

Selection guide - Section B2 ermec@ermec.com

AV series

								
Page	B2-78	B2-79	B2-80	B2-81	B2-83	B2-86	B2-87, B2-100	B2-89
General specifications								
Anti-vandal (IK08/IK10)	X	X						
Security			X	X		X	X	X
Approval (optional)	UL/CSA	UL/CSA			UL/CSA			
Sealing	Up to IP65	Up to IP65	Up to IP65	Up to IP65	Up to IP65	IP65, IP69K	Up to IP67	Up to IP65
Illumination							X	X
Marking					X			
Electrical specifications								
Maximum current	2A 48VDC (4A 250VAC)*	2A 48VDC (4A 250VAC)*	0,2A 48VDC	1A 24VDC	2A 48VDC (4A 250VAC)*	5A 15VDC 5A 250VAC	1A 30VDC	2A 48VDC
Momentary (NO)	X	X			X			
Momentary (NO) tactile			X					
Momentary (NO/NC)						X	X	
Latching				X				X
Diameter and shape								
Ø 16 (.629)	Flat		AV063	AV061				
	Curved		AV163	AV161				
Ø 19 (.748)	Flat	AV09			AV09	AV19LP	AV9	AV09..EA
	Curved	AV19			AV19	AV19LB		AV19..EA
Ø 22 (.866)	Flat		AV03				AV3	
	Curved		AV02					

() * See applicable approvals

								
Page	B2-91	B2-93, B2-95	B2-97	B2-98	B2-98	B2-102	B2-104	B2-106
General specifications								
Security	X	X	X	X	X	X	X	X
Approval (optional)			UL/CSA					
Sealing	Up to IP65	Up to IP67, IP69K	Up to IP65	Up to IP65	Up to IP65	Up to IP65	IP'65	IP65
Illumination	X	X				X		
Marking	X	X		X	X			
Electrical specifications								
Maximum current	50mA 24VDC	50mA 24VDC	2A 48VDC (4A 250VAC)*	2A 250VAC	3(1,5)A 250VAC	2A 48VDC	5A 250VAC	5A 250VAC
Momentary (NO)			X					
Momentary (NC)				X				
Momentary (NO) tactile	X	X	Mom. (NO)					
Momentary (NO/NC)							X	X
Latching						X		
Alternate action					X			
Diameter and shape								
Ø 19 (.748)	Flat	AV09C7	AV9S					
	Curved	AV19C7						
Ø 22 (.866)	Flat		AV3S	AV03	AV031200	AV044700	AV03..EA	AV22LP
	Curved			AV02	AV021200		AV02..EA	AV22LB
Ø 24 (.944)	Flat							AV22PNA
	Concave							



www.ermec.com