

Modular Range, 30mm Pilot devices

General construction

- Snap-on features reduce installation time
- Bezels: black plastic or chrome metal
- Contact block holder features rear mounting with quick-release locking mechanism for high security
- Buttons available in several colors
- Engraved text caps available
- Custom-specific markings on request
- UL File# E76003
- CSA File# LR19700

Operators

- Pushbuttons, illuminated and non-illuminated
- Mushroom pushbuttons, illuminated and non-illuminated, 40mm and 60mm diameter
- Emergency stop pushbuttons, illuminated and non-illuminated, twist or pull release
- Selector switches, illuminated and non-illuminated, 2- or 3-position, short or long handle
- Key-operated selector switches, 2- or 3-position
- Toggle switches, 2- or 3-position

Contact blocks

- Quick-mount, quick release contact block holder for fast and easy assembly/disassembly
- NO & NC contact blocks are color-coded for easy identification: Green = NO; Red = NC
- Silver-tipped contacts
- Wiping action for high reliability
- Low energy gold-plated contact blocks
- Contact block holder for three or five blocks in a single row

Pilot lights

- Full voltage, resistor and transformer
- LED and filament bulbs available

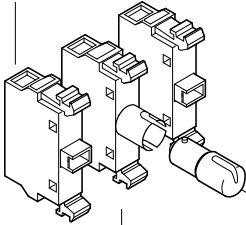
General information

Mounting

Exploded view

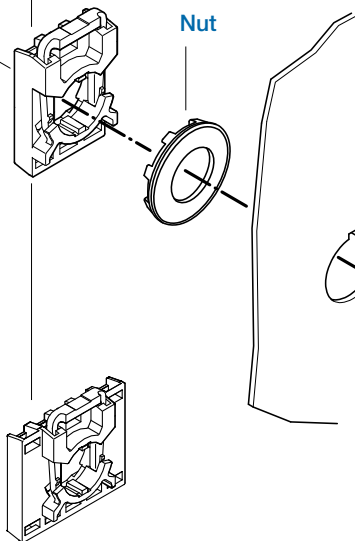
Contact block

Single pole with making or breaking contact



Holder

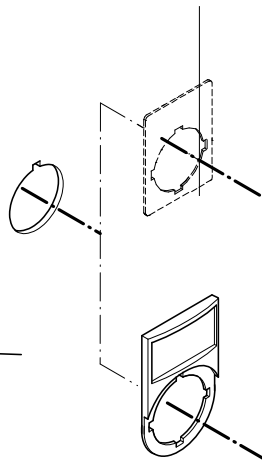
Available either for three or five blocks in one single row. Additional blocks can be stacked on holders for three blocks.



Nut

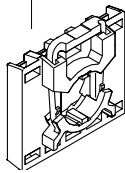
Legend plates

Of aluminum with slots that guide the legend plate and the operator into the correct position.



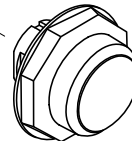
Lamp block

Illuminated pushbuttons, illuminated selector switches and pilot lights have a lamp block in the center position of the holder.



Operator

Buttons, lenses and handles in several colors. Illuminated or non-illuminated.

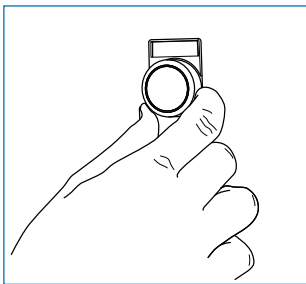


Five block holder

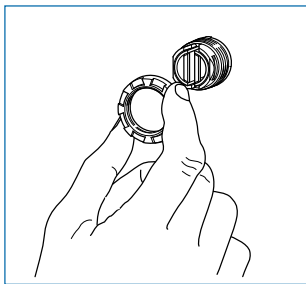
Bezels

Pushbuttons, selector switches and toggle switches with bezel in black plastic, chrome metal are available.

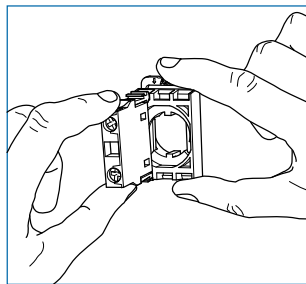
Easy to mount



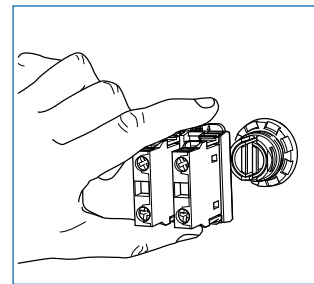
The operator is to be inserted from the front.....



...and secured at the back with a nut.

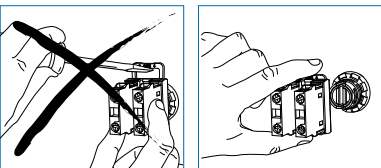


The contact blocks/lamp block are then snapped on to the holder..



...and the holder snaps on to the operator.

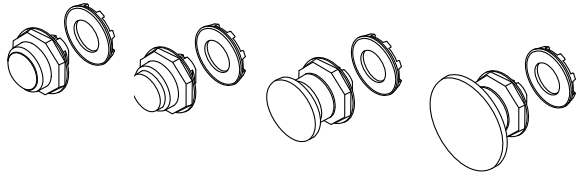
...and to remove



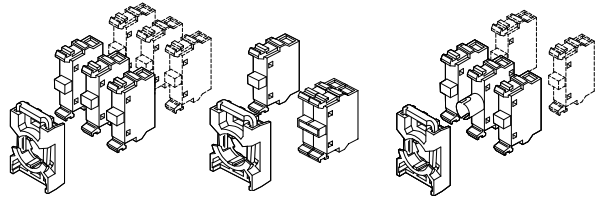
Press down the spring on the holder and pull the holder from the actuator.

Selection guide

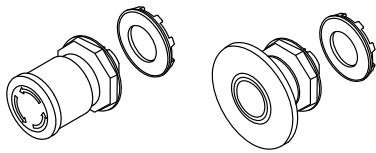
Pushbuttons and Mushroom pushbuttons



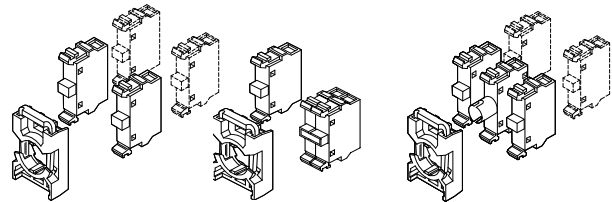
Contact block/lamp block combinations



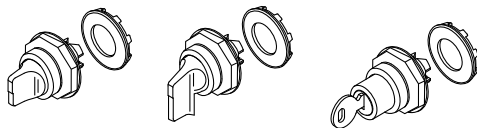
Emergency stop pushbuttons



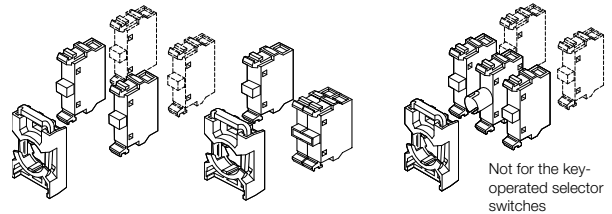
Contact block/lamp block combinations



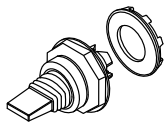
Selector switches



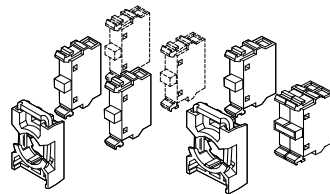
Contact block/lamp block combinations



Toggle switches



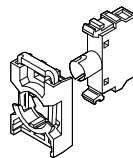
Contact block combinations



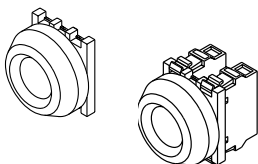
Pilot lights



Lamp block combination



Extreme duty pushbuttons



Flush and extended pushbuttons

Non-illuminated and illuminated

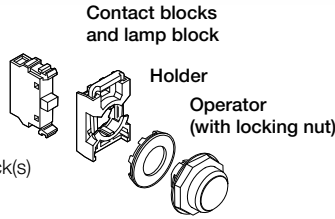
Momentary and maintained

How to order non-illuminated:

- Alt.1** • Operator
 + Holder
 + Contact block(s)
- Alt.2** • Operator
 + Holder with Contact block(s)

How to order illuminated:

- Alt.1** • Operator
 + Holder
 + Contact block(s)
 + LED/lamp block
- Alt.2** • Operator
 + Holder with Contact block(s)
 and lamp block

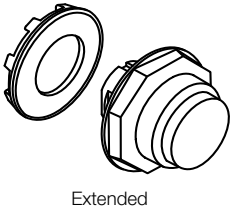
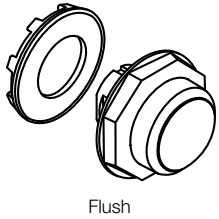


Δ Non-Illuminated button color		‡ Illuminated button color	
R Red	G Green	R Red	G Green
Y Yellow	L Blue	Y Yellow	L Blue
W White	B Black	W White	B Black
C Clear			

To select button color, substitute the Δ or the ‡ in the catalog number with the above color letter code.
 EX: G1MP1-10R (for a red button).

NOTE: No contact block in center position, reserved for LED/lamp block
 For contact blocks, holders & LED lamp blocks, see Accessories pages 7.54 - 7.58.

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Non-illuminated

Description	Catalog number
Black plastic bezel	
Flush, momentary	G1MP1-10Δ
Flush, maintained	G1MP2-10Δ
Extended, momentary	G1MP3-10Δ
Extended, maintained	G1MP4-10Δ
Chrome bezel	
Flush, momentary	G2MP1-30Δ
Flush, maintained	G2MP2-30Δ
Extended, momentary	G2MP3-30Δ
Extended, maintained	G2MP4-30Δ

Illuminated^①

Description	Catalog number
Black plastic bezel	
Flush, momentary	G1MP1-11‡
Flush, maintained	G1MP2-11‡
Extended, momentary	G1MP3-11‡
Extended, maintained	G1MP4-11‡
Chrome bezel	
Flush, momentary	G2MP1-31‡
Flush, maintained	G2MP2-31‡
Extended, momentary	G2MP3-31‡
Extended, maintained	G2MP4-31‡

① No contact block in the center position.

② Lamp block MLB-1. Bulb not included. Other lamp block see Accessories, bulb max 1.2 W.

Mushroom pushbuttons

Non-illuminated and illuminated

Momentary

How to order non-illuminated:

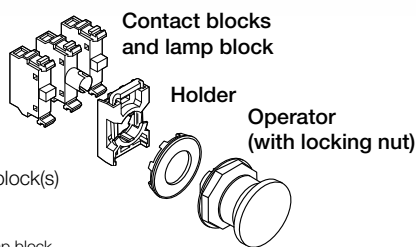
Alt.1 • Operator
+ Holder
+ Contact block(s)

Alt.2 • Operator
+ Holder with Contact block(s)

How to order illuminated:

Alt.1 • Operator
+ Holder
+ Contact block(s)
+ LED/lamp block

Alt.2 • Operator
+ Holder with Contact block(s)
and lamp block

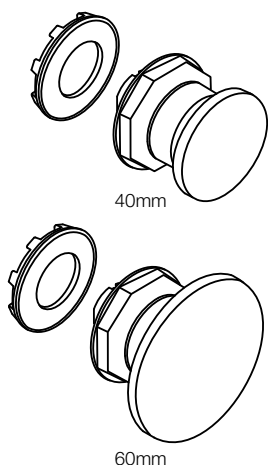


Δ Non-illuminated button color	‡ Illuminated button color
R Red	R Red
Y Yellow	Y Yellow
B Black	G Green

To select button color, substitute the Δ or the ‡ in the catalog number with the above color letter code.

EX: G1MPM1-10R (for a red button).

NOTE: No contact block in center position, reserved for LED/lamp block.
For contact blocks, holders & LED lamp blocks, see Accessories pages 7.54 - 7.58.



Non-illuminated

Description	Catalog number
Black plastic bezel 40mm 60mm	G1MPM1-10Δ G1MPM2-10Δ
Chrome bezel 40mm 60mm	G2MPM1-30Δ G2MPM2-30Δ

Illuminated[Ⓢ]

Description	Catalog number
Black plastic bezel 40mm 60mm	G1MPM1-11‡ G1MPM2-11‡
Chrome bezel 40mm 60mm	G2MPM1-31‡ G2MPM2-31‡

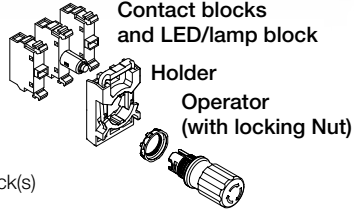
Ⓢ No contact block in the center position

Ⓢ Lamp block MLB-1. Bulb not included. Other lamp block see Accessories, bulb max 1.2 W.

Emergency stop pushbuttons

Non-illuminated and illuminated

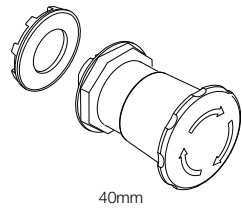
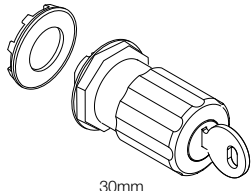
30mm, 40mm & 60mm head

How to order non-illuminated:	How to order illuminated:	
Alt.1 • Operator + Holder + Contact block(s) Alt.2 • Operator + Holder with Contact block(s)	Alt.1 • Operator + Holder + Contact block(s) + LED/lamp block Alt.2 • Operator + Holder with Contact block(s) and LED/lamp block	

NOTE: No contact block in center position, reserved for LED/lamp block.
For contact blocks, holders & LED lamp blocks, see Accessories pages 7.54 - 7.58.

7 Fulfills IEC 60947-5-5

Operator: Emergency Stop



		Description	Catalog number
Non-Illuminated			
30mm			
Black Plastic Bezel			
Red	Twist release		G1MPET3-10R
Red	Key release (Key code 71, Ronis 455)		G1MPEK3-11R
Red	Key release (Key code 72, Ronis 421)		G1MPEK3-12R
Red	Key release (Key code 73, Ronis 3433-E)		G1MPEK3-13R
Chrome Bezel			
Red	Twist release		G2MPET3-10R
Red	Key release (Key code 71, Ronis 455)		G2MPEK3-11R
Red	Key release (Key code 72, Ronis 421)		G2MPEK3-12R
Red	Key release (Key code 73, Ronis 3433-E)		G2MPEK3-13R
40mm			
Black Plastic Bezel			
Red	Twist release		G1MPET4-10R
Red	Key release (Key code 71, Ronis 455)		G1MPEK4-11R
Red	Key release (Key code 72, Ronis 421)		G1MPEK4-12R
Red	Key release (Key code 73, Ronis 3433-E)		G1MPEK4-13R
Chrome Bezel			
Red	Twist release		G2MPET4-10R
Red	Key release (Key code 71, Ronis 455)		G2MPEK4-11R
Red	Key release (Key code 72, Ronis 421)		G2MPEK4-12R
Red	Key release (Key code 73, Ronis 3433-E)		G2MPEK4-13R
Illuminated			
40mm			
Black Plastic Bezel			
Red	Twist release		G1MPMT3-11R
Chrome Bezel			
Red	Twist release		G2MPMT3-11R
60mm			
Black Plastic Bezel			
Red	Twist release		G1MPMT4-11R
Chrome Bezel			
Red	Twist release		G2MPMT4-11R

Pull release operators

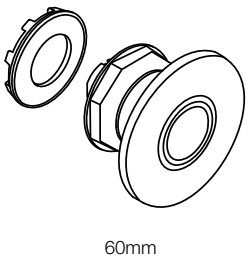
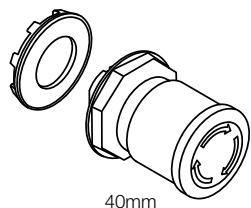
Non-illuminated and illuminated
30mm, 40mm & 60mm head

How to order non-illuminated:	How to order illuminated:	<p>Contact blocks and LED/lamp block Holder Operator (with locking Nut)</p>
Alt.1 • Operator + Holder + Contact block(s) Alt.2 • Operator + Holder with Contact block(s)	Alt.1 • Operator + Holder + Contact block(s) + LED/lamp block Alt.2 • Operator + Holder with Contact block(s) and LED/lamp block	

NOTE: No contact block in center position, reserved for LED/lamp block.
For contact blocks, holders & LED lamp blocks, see Accessories pages 7.54 - 7.58.

Fulfills IEC 60947-5-5

Operator: Twist or pull release operators



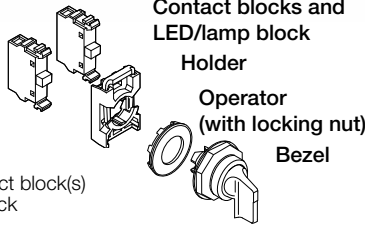
	Description	Catalog number
Non-Illuminated		
30mm		
Black Plastic Bezel		
Red	Pull release	G1MPEP3-10R
Chrome bezel		
Red	Pull release	G2MEP3-10R
40mm		
Black Plastic Bezel		
Red	Pull release	G1MPEP4-10R
Chrome Bezel		
Red	Twist release	G2MPET4-10R
Illuminated		
40mm		
Black Plastic Bezel		
Red	Pull release	G1MPMP3-11R
Chrome bezel		
Red	Pull release	G2MPMP3-11R
60mm		
Black Plastic Bezel		
Red	Pull release	G1MPMP4-11R
Chrome Bezel		
Red	Twist release	G2MPMP4-11R

Two position selector switches Non-illuminated

How to order:

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

- Alt.2** • Operator
+ Holder with Contact block(s)
and LED/lamp block



Contact blocks and
LED/lamp block
Holder

Operator
(with locking nut)
Bezel

Δ Non-illuminated handle color

R Red

B Black

U Grey

To select handle color,
substitute the Δ in the catalog
number with the above color
letter code.
EX: G1M2SS1-10ΔR (for a red
button).

NOTE: No contact block in center position, reserved for LED/lamp block.
For contact blocks & holders, see Accessories pages 7.54.

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Non-illuminated

Description

Catalog number

Short handle

Black plastic bezel

Maintained B & C
Maintained A & C
Spring return from C to B

G1M2SS1-10Δ
G1M2SS2-10Δ
G1M2SS3-10Δ

Chrome bezel

Maintained B & C
Maintained A & C
Spring return from C to B

G2M2SS1-30Δ
G2M2SS2-30Δ
G2M2SS3-30Δ

Long handle

Black plastic bezel

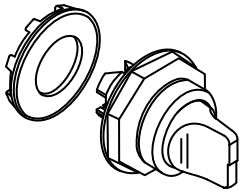
Maintained B & C
Maintained A & C
Spring return from C to B

G1M2SS4-10Δ
G1M2SS5-10Δ
G1M2SS6-10Δ

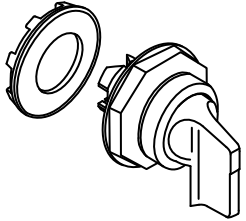
Chrome bezel

Maintained B & C
Maintained A & C
Spring return from C to B

G2M2SS4-30Δ
G2M2SS5-30Δ
G2M2SS6-30Δ

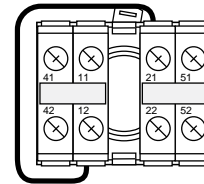
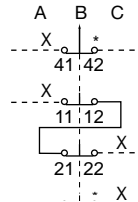
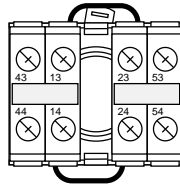
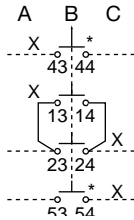


Short handle



Long handle

Center position connection detail



Maintained	Maintained
Momentary, spring return from C to B	

Contact functions

Block positions as seen from
operator front.

Handle position	Left block	Right block
A (B)	O	O
C	x	x

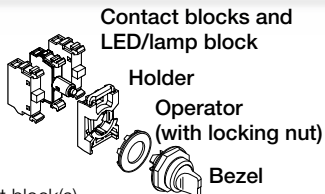
O = not actuated (normal state)
x = actuated (state changed)

Two position selector switches Illuminated

How to order:

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

- Alt.2** • Operator
+ Holder with Contact block(s)
and LED/lamp block



Δ Illuminated handle color

R Red	L Blue
G Green	C Clear
Y Yellow	

To select handle color, substitute the Δ in the catalog number with the above color letter code.
EX: G1M2SS1-11R (for a red handle).

For contact blocks, holders & LED lamp blocks, see Accessories pages 7.54 - 7.58.

Illuminated®

Description

Catalog number

Short handle

Black plastic bezel

Maintained B & C
Maintained A & C
Spring return from C to B

G1M2SS1-11Δ
G1M2SS2-11Δ
G1M2SS3-11Δ

Chrome bezel

Maintained B & C
Maintained A & C
Spring return from C to B

G2M2SS1-31Δ
G2M2SS2-31Δ
G2M2SS3-31Δ

Long handle

Black plastic bezel

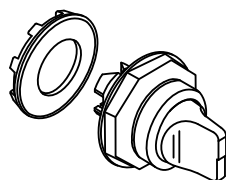
Maintained B & C
Maintained A & C
Spring return from C to B

G1M2SS4-11Δ
G1M2SS5-11Δ
G1M2SS6-11Δ

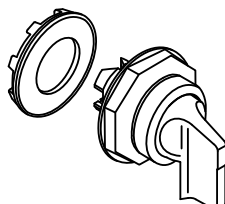
Chrome bezel

Maintained B & C
Maintained A & C
Spring return from C to B

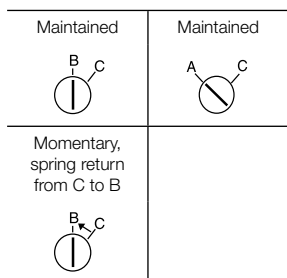
G2M2SS4-31Δ
G2M2SS5-31Δ
G2M2SS6-31Δ



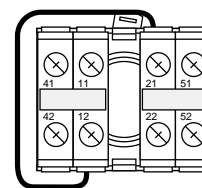
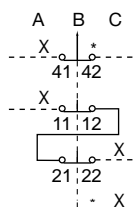
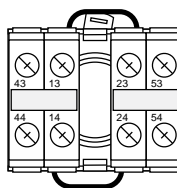
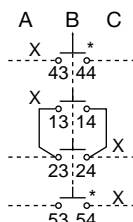
Short handle



Long handle



Center position connection detail



① No contact block in the center position

② Lamp block MLB-1. Bulb not included. Other lamp block see Accessories, bulb max 1.2 W.

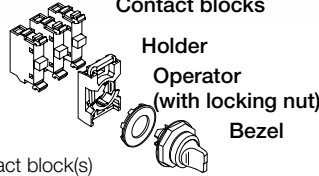
Three position selector switches

Non-illuminated

How to order:

Alt.1 • Operator
 + Holder
 + Contact block(s)

Alt.2 • Operator
 + Holder with contact block(s)



Δ Non-illuminated handle color

R Red

B Black

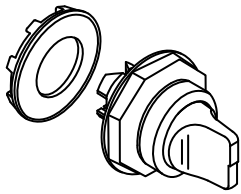
U Grey

To select handle color, substitute the Δ in the catalog number with the above color letter code.
 EX: G1M3SS1-10R (for a red handle).

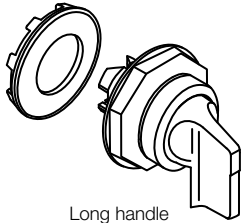
NOTE: No contact block in center position.

For contact blocks & holders, see Accessories pages 7.54.

7



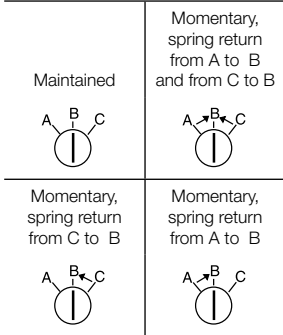
Short handle



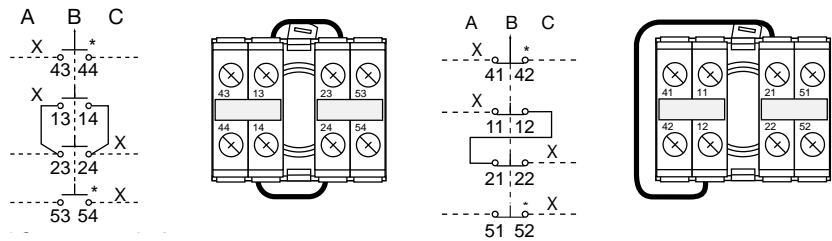
Long handle

Non-illuminated

Description	Catalog number
Short handle	
Black plastic bezel	
Maintained A, B & C	G1M3SS1-10Δ
Spring return A & C to B	G1M3SS2-10Δ
Maint A, Spring ret C to B	G1M3SS3-10Δ
Maint C, Spring ret A to B	G1M3SS7-10Δ
Chrome bezel	
Maintained A, B & C	G2M3SS1-30Δ
Spring return A & C to B	G2M3SS2-30Δ
Maint A, Spring ret C to B	G2M3SS3-30Δ
Maint C, Spring ret A to B	G2M3SS7-30Δ
Long handle	
Black plastic bezel	
Maintained A, B & C	G1M3SS4-10Δ
Spring return A & C to B	G1M3SS5-10Δ
Maint A, Spring ret C to B	G1M3SS6-10Δ
Maint C, Spring ret A to B	G1M3SS8-10Δ
Chrome bezel	
Maintained A, B & C	G2M3SS4-30Δ
Spring return A & C to B	G2M3SS5-30Δ
Maint A, Spring ret C to B	G2M3SS6-30Δ
Maint C, Spring ret A to B	G2M3SS8-30Δ



Center position connection detail



Three position selector switches Illuminated

How to order:

Alt.1

- Operator
- + Holder
- + Contact block(s)
- + LED/lamp block

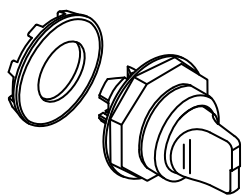
Alt.2

- Operator
- + Holder with Contact block(s) and LED/lamp block

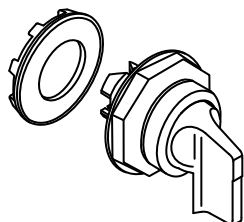
Δ Illuminated handle color	
R Red	L Blue
G Green	C Clear
Y Yellow	

To select handle color, substitute the Δ in the catalog number with the above color letter code.
EX: G1M3SS1-11R (for a red handle).

NOTE: For contact blocks, holders & LED lamp blocks, see Accessories pages 7.54 - 7.58.



Short handle

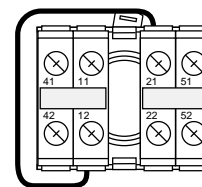
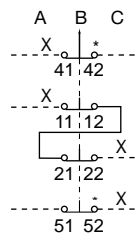
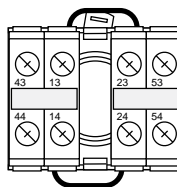
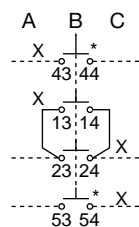
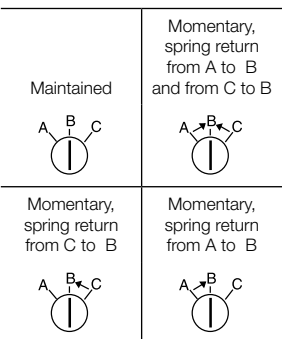


Long handle

Illuminated[Ⓛ]

Description	Catalog number
Short handle	
Black plastic bezel	
Maintained A, B & C	G1M3SS1-11Δ
Spring return A & C to B	G1M3SS2-11Δ
Maint A, Spring ret C to B	G1M3SS3-11Δ
Maint C, Spring ret A to B	G1M3SS7-11Δ
Chrome bezel	
Maintained A, B & C	G2M3SS1-31Δ
Spring return A & C to B	G2M3SS2-31Δ
Maint A, Spring ret C to B	G2M3SS3-31Δ
Maint C, Spring ret A to B	G2M3SS7-31Δ
Long handle	
Black plastic bezel	
Maintained A, B & C	G1M3SS4-11Δ
Spring return A & C to B	G1M3SS5-11Δ
Maint A, Spring ret C to B	G1M3SS6-11Δ
Maint C, Spring ret A to B	G1M3SS8-11Δ
Chrome bezel	
Maintained A, B & C	G2M3SS4-31Δ
Spring return A & C to B	G2M3SS5-31Δ
Maint A, Spring ret C to B	G2M3SS6-31Δ
Maint C, Spring ret A to B	G2M3SS8-31Δ

Center position connection detail



Ⓛ No contact block in the center position

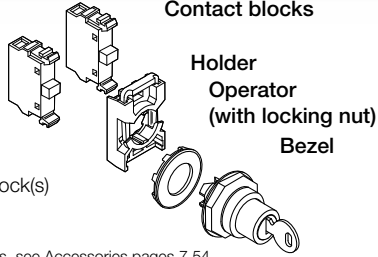
Key-operated selector switches ①

Two and three position

How to order:

Alt.1 • Operator
 + Holder
 + Contact block(s)
 + LED/lamp block

Alt.2 • Operator
 + Holder with Contact block(s)
 and LED/lamp block



Δ Key codes

1 Ronis 71

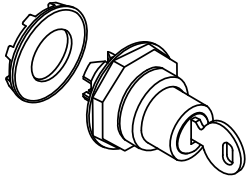
2 Ronis 72

3 Ronis 73

To select desired key code, substitute the Δ in the catalog number with the above key letter code.
 EX: G1M2SSK1-10Δ (Ronis 72 key)

NOTE: For contact blocks & holders, see Accessories pages 7.54.

7



Two position	Three position
Maintained 	Maintained
Maintained 	Maintained
Momentary, spring return from C to B 	Momentary, spring return from A to B and from C to B
	Momentary, spring return from C to B
	Momentary, spring return from C to B

Description	The key can be removed in...	Catalog number
2-position		
Black plastic bezel		
Maintained B & C	B & C	G1M2SSK1-10Δ
Maintained B & C	B only	G1M2SSK2-10Δ
Spring return C to B	B only	G1M2SSK3-10Δ
Chrome bezel		
Maintained B & C	B & C	G2M2SSK1-30Δ
Maintained B & C	B only	G2M2SSK2-30Δ
Spring return C to B	B only	G2M2SSK3-30Δ
3-position		
Black plastic bezel		
Maintained A, B, & C	A, B & C	G1M3SSK1-10Δ
Maintained A, B, & C	B only	G1M3SSK2-10Δ
Spring return A & C to B	B only	G1M3SSK3-10Δ
Spring return C to B	A only	G1M3SSK4-10Δ
Spring return C to B	A, B, & C	G1M3SSK5-10Δ
Chrome bezel		
Maintained A, B, & C	A, B & C	G2M3SSK1-30Δ
Maintained A, B, & C	B only	G2M3SSK2-30Δ
Spring return A & C to B	B only	G2M3SSK3-30Δ
Spring return C to B	A only	G2M3SSK4-30Δ
Spring return C to B	A, B, & C	G2M3SSK5-30Δ

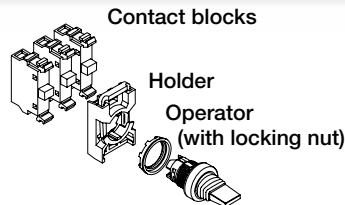
① Includes two keys

Toggle switches

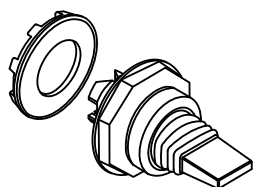
Two and three position

How to order:

- Alt.1** • Operator
+ Holder
+ Contact block(s)
- Alt.2** • Operator
+ Holder with Contact block(s)



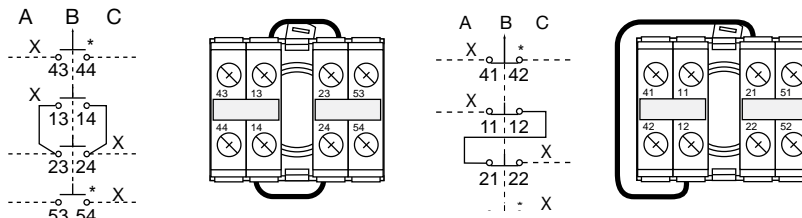
NOTE: For contact blocks & holders, see Accessories pages 7.54.



Description	Catalog number
2-position	
Maintained, black bezel	G1MTS1-10B
Maintained, chrome bezel	G2MTS1-30B
3-position	
Maintained, black bezel	G1MTS3-10B
Maintained, chrome bezel	G2MTS3-30B
Spring return from A and C to B, black bezel	G1MTS2-10B
Spring return from A and C to B, chrome bezel	G2MTS2-30B

Two position	Three position
Maintained	Momentary, spring return from A to B and from C to B
	Maintained

Center position connection detail

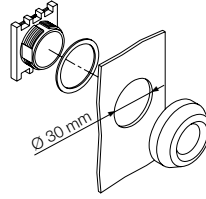


Extreme duty pushbuttons for 30mm mounting hole

How to order

- Operator
- + Contact block(s)

Mounting



NOTE: For contact blocks, see Accessories pages 7.54.

Operator: Extreme duty pushbutton

The Extreme duty pushbutton, for 30 mm hole, is a robust and compact pushbutton for use in cold, hot, damp, oily and other tough environments. Suitable especially for hydraulic lifts, compact pendant controllers and pushbutton stations.

Description	Included contact blocks	Catalog number	Weight oz.
Red	-	KP6-40R	0.78
Green	-	KP6-40G	0.78
black	-	KP6-40B	0.78
black	1 NO + 1 NC	KP6-40B-11	1.7
black	1 NO	KP6-40B-10	1.2
black	1 NC	KP6-40B-01	1.2
black	2 NO	KP6-40B-20	1.7
black	2 NC	KP6-40B-02	1.7

Contact blocks

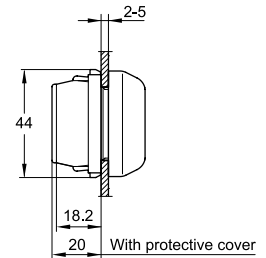
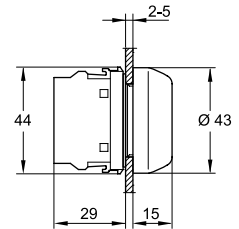
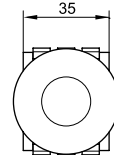
1 NO	MCB-10	0.46
1 NC	MCB-01	0.46

Accessories

Guide washer for positioning and anti-rotation	2154 373-1	
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Technical data

Degree of protection	IP66 UL Catalog number 1, 3R, 4, 4X
Ambient temperature	-30° — +70°



Red



Green



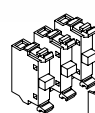
Black

Pilot lights

How to order:

Alt.1 • Operator
+ Holder
+ Contact block(s)

Alt.2 • Operator
+ Holder with Contact block(s)



Contact blocks

Holder

Operator (with locking nut)



Δ Lens color

R Red	L Blue
G Green	W White
Y Yellow	C Clear

To select lens color, substitute the Δ in the catalog number with the above color letter code.

EX: G1ML1-100R (for a red lens).

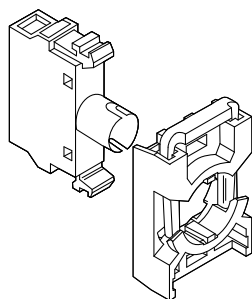
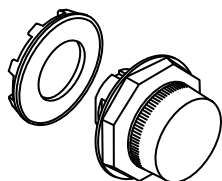
NOTE: For contact blocks, see Accessories pages 7.54.

Description

Black plastic mounting ring
Chrome mounting ring

Catalog number

G1ML1-100Δ
G2ML1-100Δ



Lamp block + holder



Diffusing lens

Lamp blocks with holder ①

Supply voltage

Catalog number

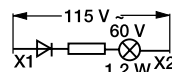
For max. 2 W, 230 V AC and DC
filament bulb or LED

$$\frac{230 \text{ V, } 2 \text{ W}}{X1 \quad \otimes \quad X2}$$

115 V AC supply voltage.

MCBH-001

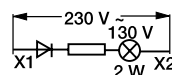
For 60 V filament bulb
max. 1.2 W



230 V AC supply voltage.

MCBH-002

For 130 V filament bulb
max. 2 W



MCBH-003

Light diffusing lens

To improve illumination. *Note: Cannot be used with text cap.*

Description

The lens is used instead of text cap

Catalog number

KA1-8005

① Bulb not included. See page 7.48

Accessories

Transformer and lamp blocks



Transformer block for pilot lights

Description	Bulb suffix		Catalog number	Weight oz.	
	LED	Filament			
Transformer blocks for pilot lights					
For 6 or 24 V Filament bulb and 24 V LED. Max 1.2 W Filament bulb lamp block included in the transformer, BA 9s base					
Primary voltage	Secondary voltage				
110-127 V AC	6 V AC	-	T2	KTR1-1001	3.4
220-250 V AC	6 V AC	-	T2	KTR1-1002	3.4
380-420 V AC	6 V AC	-	T3	KTR1-1003	3.4
440-480 V AC	6 V AC	-	T4	KTR1-1004	3.4
500-600 V AC	6 V AC	-	T5	KTR1-1005	3.4
110-127 V AC	24 V AC ¹⁾	T1	T6	KTR1-1011	3.4
220-250 V AC	24 V AC ¹⁾	T2	T7	KTR1-1012	3.4
380-420 V AC	24 V AC ¹⁾	T3	T8	KTR1-1013	3.4
440-480 V AC	24 V AC ¹⁾	T4	T9	KTR1-1014	3.4

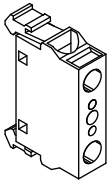
Transformer blocks for illuminated operators - Intended to supply 1.2W filament bulb mounted in lamp block MLB-J only

110-127 V AC	6 V AC	-	T2	KTR1-2001	3.4
220-250 V AC	6 V AC	-	T2	KTR1-2002	3.4
380-420 V AC	6 V AC	-	T3	KTR1-2003	3.4
440-480 V AC	6 V AC	-	T4	KTR1-2004	3.4
500-600 V AC	6 V AC	-	T5	KTR1-2005	3.4
110-127 V AC	24 V AC ¹⁾	T1	T6	KTR1-2011	3.4
220-250 V AC	24 V AC ¹⁾	T2	T7	KTR1-2012	3.4
380-420 V AC	24 V AC ¹⁾	T3	T8	KTR1-2013	3.4
440-480 V AC	24 V AC ¹⁾	T4	T9	KTR1-2014	3.4

¹⁾ Can be used with LED bulb



Transformer block for illuminated operators



Diode block

Diode block

Diode block	MDB-1001	0.53
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Note: To be used if several lamps are to be connected to a common lamp-test pushbutton. A diode must be connected in series with each lamp. The Diode block snaps onto the lamp block or is placed at the side

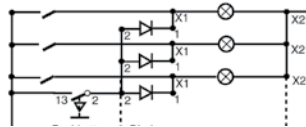


Diagram for lamp test with three Diode blocks (not intended for integrated LED bulbs)

Single lamp blocks for front mounting, BA 9s base

Description	Catalog number	Weight oz.	
<p>230 V, 2 W X1 — X2</p>	For max. 2 W, 230 V AC and DC Filament bulb or LED	MLB-1	0.53
<p>115 V X1 — 60 V — X2 1.2 W</p>	115 V AC supply voltage. For 60 V Filament bulb 1.2 W	MLB-2	0.60
<p>230 V X1 — 130 V — X2 2 W</p>	230 V AC supply voltage. For 130 V Filament bulb 2 W	MLB-3	0.71
<p>115 V X1 — 24 V — X2 LED</p>	115 V AC and DC supply voltage For 24 V LED only	MLB-4	0.60
<p>LED X1 — H-N — X2 24-230V</p>	LED block designed to prevent glowing from leakage current.	MLB-8	0.53

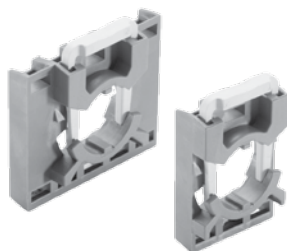
NOTE: Package order quantities will apply.



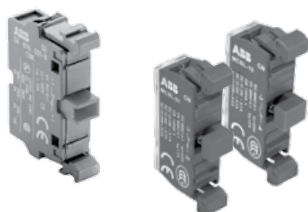
Lamp block

Accessories

Contact blocks and holders



Holders for contact block

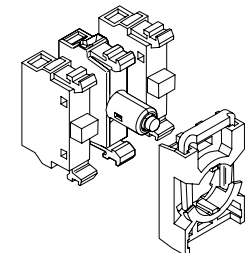
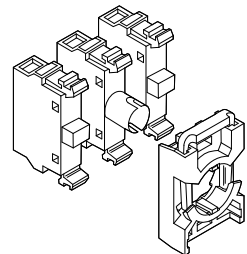
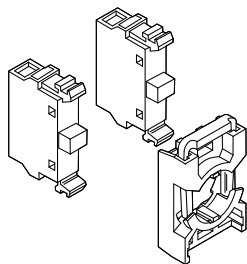


Contact block

Micro switch blocks



Double contact blocks



Description	Catalog number	Weight oz.
Holders		
Holders for three blocks	MCBH-00	0.21
Holders for five blocks*	MCBH5-00	0.28

* Note: Double contact blocks are required on side positions

Single contact blocks for front mounting

1 NO	MCB-10	0.46
1 NC	MCB-01	0.46
1 NO w/gold plated contacts	MCB-10G	0.46
1 NC w/gold plated contacts	MCB-01G	0.46

Micro switch blocks

1 NO	MCBL-10	0.35
1 NC	MCBL-01	0.35

Double contact block for front mounting

2 NO	MCB-20	0.92
2 NC	MCB-02	0.92
1 NO + 1 NC	MCB-11	0.92
2NC w/gold plated contacts	MCB-02G	0.92
2NO w/gold plated contacts	MCB-20G	0.92

Note: To be used together with MCBH5-00 when Contact blocks in position 4- and 5- are needed. Also when using 2nd lamp blocks MCBH-00 together with Selector Switch and Contact block in position 3- is needed

Contact blocks with holder for front mounting ①

For non-illuminated operators

1 NC	MCBH-01
1 NO	MCBH-10
2 NC	MCBH-02
2 NO	MCBH-20
3 NC	MCBH-03
3 NO	MCBH-30
1 NO + 1 NC	MCBH-11
1 NO + 2 NC	MCBH-12
2 NO + 1 NC	MCBH-21

For illuminated operator

1 LB	MCBH-001
1 NC + 1 LB	MCBH-011
1 NO + 1 LB	MCBH-101
1 NO + 1 NC + 1 LB	MCBH-111
2 NO & 1 LB	MCBH-021
2 NO & 1 LB	MCBH-201

① Max. # of blocks in holder is 3.

Accessories LED bulbs



LED bulbs

Description	Wavelength nm	Luminance mcd	Catalog number	Weight oz.
-------------	------------------	------------------	-------------------	---------------

LED bulbs

With one diode chip mounted on a Ba 9s base. Choose the same color for the LED and the lamp cap or else use a clear lamp cap.

For white light use white LED with clear lamp cap. At DC the lamp base have to be connected to cathode (-) and the bottom contact to anode (+).

Rated voltage 12 V, DC, rated current 15 mA, service life >50 000 h

Red	630	250	KA2-2011	0.18
Green	525	1000	KA2-2012	0.18
Yellow	592	250	KA2-2013	0.18
Blue	470	450	KA2-2014	0.18
White	¹⁾	600	KA2-2015	0.18

Rated voltage 24 V, (AC)/DC, rated current 15 mA, service life >50 000 h

Red	630	250	KA2-2021	0.18
Green	525	800	KA2-2022	0.18
Yellow	592	250	KA2-2023	0.18
Blue	470	400	KA2-2024	0.18
White	¹⁾	500	KA2-2025	0.18

Rated voltage 36 V, (AC)/DC, rated current 12 mA, service life >50 000 h

Red	630	200	KA2-2031	0.18
Green	525	2000	KA2-2032	0.18
Yellow	592	200	KA2-2033	0.18
Blue	470	750	KA2-2034	0.18
White	¹⁾	1400	KA2-2035	0.18

Rated voltage 48 V, (AC)/DC, rated current 12 mA, service life >50 000 h

Red	630	200	KA2-2041	0.18
Green	525	1700	KA2-2042	0.18
Yellow	592	240	KA2-2043	0.18
Blue	470	720	KA2-2044	0.18
White	¹⁾	1200	KA2-2045	0.18

Rated voltage 60 V, (AC)/DC, rated current 10 mA, service life >50 000 h

Red	630	160	KA2-2051	0.18
Green	525	1400	KA2-2052	0.18
Yellow	592	200	KA2-2053	0.18
Blue	470	600	KA2-2054	0.18
White	¹⁾	1000	KA2-2055	0.18

Rated voltage 110-130 V, AC, rated current 4-6 mA, service life 25 000 h

Red	630	60-100	KA2-2131	0.18
Green	525	500-850	KA2-2132	0.18
Yellow	592	70-120	KA2-2133	0.18
Blue	470	220-350	KA2-2134	0.18
White	¹⁾	350-600	KA2-2135	0.18

Rated voltage 110-130 V, AC/DC, rated current 4-6 mA, service life 25 000 h

Red	630	60	KA2-2141	0.18
Green	525	500	KA2-2142	0.18
Yellow	592	70	KA2-2143	0.18
Blue	470	220	KA2-2144	0.18
White	¹⁾	350	KA2-2145	0.18

Rated voltage 230 V, AC, rated current 4 mA, service life 25 000 h

Red	630	60	KA2-2221	0.18
Green	525	500	KA2-2222	0.18
Yellow	592	70	KA2-2223	0.18
Blue	470	220	KA2-2224	0.18
White	¹⁾	350	KA2-2225	0.18

Note: Care should be taken for DC supply where + and - must be correctly connected. This is marked X1 (+) and X2 (-) on the product.

Choose the same color on the LED as on the lamp cap.

¹⁾ X=0.31, Y=0.32 according to the ICI Chromaticity Diagram.

Accessories

LED and filament bulbs



LED bulbs

Description	Wavelength nm	Luminance mcd	Catalog number	Weight oz.
LED bulbs continued				
Rated voltage 230 V, AC/DC, rated current 4 mA, service life 25 000 h				
Red	630	60	KA2-2231	0.18
Green	525	500	KA2-2232	0.18
Yellow	592	70	KA2-2233	0.18
Blue	470	220	KA2-2234	0.18
White	¹⁾	350	KA2-2235	0.18

Note: Care should be taken for DC supply where + and - must be correctly connected. This is marked X1 (+) and X2 (-) on the product.

Choose the same color on the LED as on the lamp cap.

¹⁾ X=0.31, Y=0.32 according to the ICI Chromaticity Diagram.

Flashing LED bulbs

Rated voltage 24 V, DC rated current 25 mA

Description	Wavelength nm	Service life hours	Catalog number	Weight oz.
Red	630	50 000	4950 512-1	0.18
Green	565	50 000	4950 512-2	0.18
Yellow	585	50 000	4950 512-3	0.18

Note: Care should be taken for DC supply where + and - must be correctly connected. This is marked X1 (+) and X2 (-) on the product.

Choose the same color on the LED as on the lamp cap.



Filament bulbs

Filament bulbs BA 9s base

Rated voltage V m AC/DC	Rated current A	Rated output W	Service life h	Luminance mcd	Catalog number	Weight oz.
6	200	1.2	10 000	350	5911 086-11	0.071
12	100	1.2	10 000	203	5911 086-12	0.071
24	50	1.2	10 000	280	5911 086-13	0.071
30	40	1.2	10 000	250	5911 086-4	0.071
48	42	2	6 000	500	5911 086-5	0.071
60	20	1.2	5 000	190	5911 086-14	0.071
110	18	2	7 500	250	5911 086-7	0.071
130	15	2	7 500	120	5911 086-15	0.071

A lamp Changing Tool is required for changing bulb.

Lamp changing tool

For LED bulbs and for bulbs	KA1-8072	0.071
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A lamp changing tool is required for changing bulb.



Lamp changing tool

Accessories

LED blocks, front mounting



LED block with built in leakage current protection

7

Description	Rated Current mA	Wavelength nm	Luminance mcd	Catalog number	Weight oz.
LED-blocks					
Lamp block with one diode chip integrated into lamp block. Choose the same color for the LED and the lamp cap or else use a clear cap.					
Rated voltage 12 V, DC					
Red	12.0	620	320	MLBL-00R	0.42
Green	9.3	520	1500	MLBL-00G	0.42
Yellow	12.0	588	380	MLBL-00Y	0.42
Blue	9.5	468	450	MLBL-00L	0.42
White	9.3	²⁾	600	MLBL-00W	0.42
Rated voltage 24 V, AC/DC					
Red	9.9	620	250	MLBL-01R	0.42
Green	9.2	520	1500	MLBL-01G	0.42
Yellow	9.9	588	250	MLBL-01Y	0.42
Blue	9.3	468	450	MLBL-01L	0.42
White	9.2	²⁾	600	MLBL-01W	0.42
Rated voltage 48 V, AC/DC					
Red	10.0	620	260	MLBL-02R	0.42
Green	9.7	520	1500	MLBL-02G	0.42
Yellow	10.0	588	300	MLBL-02Y	0.42
Blue	9.7	468	450	MLBL-02L	0.42
White	9.7	¹⁾	600	MLBL-02W	0.42
Rated voltage 60 V, AC/DC					
Red	13.0	620	350	MLBL-03R	0.42
Green	12.7	520	2000	MLBL-03G	0.42
Yellow	13.0	588	400	MLBL-03Y	0.42
Blue	12.7	468	550	MLBL-03L	0.42
White	12.7	¹⁾	750	MLBL-03W	0.42
Rated voltage 110-130 V, AC					
Red	8.6	620	200	MLBL-04R	0.42
Green	8.5	520	1200	MLBL-04G	0.42
Yellow	8.6	588	250	MLBL-04Y	0.42
Blue	7.0	468	400	MLBL-04L	0.42
White	7.0	¹⁾	500	MLBL-04W	0.42
Rated voltage 110-130 V, DC					
Red	9.9	620	250	MLBL-05R	0.42
Green	9.8	520	1500	MLBL-05G	0.42
Yellow	9.9	588	300	MLBL-05Y	0.42
Blue	9.8	468	450	MLBL-05L	0.42
White	9.8	¹⁾	600	MLBL-05W	0.42
Rated voltage 220 V, DC					
Red	8.0	620	180	MLBL-06R	0.42
Green	8.0	520	110	MLBL-06G	0.42
Yellow	8.0	588	200	MLBL-06Y	0.42
Blue	8.0	468	450	MLBL-06L	0.42
White	8.0	¹⁾	600	MLBL-06W	0.42
Rated voltage 230 V, AC					
Red	9.5	620	250	MLBL-07R	0.42
Green	9.4	520	1500	MLBL-07G	0.42
Yellow	9.5	588	300	MLBL-07Y	0.42
Blue	8.2	468	450	MLBL-07L	0.42
White	8.2	¹⁾	600	MLBL-07W	0.42

Note: Care should be taken for DC supply where + and - must be correctly connected. This is marked X1 (+) and X2 (-) on the product.

¹⁾ X=0.31, Y=0.32 according to the ICI Chromaticity Diagram.

Accessories

LED blocks, front mounting



LED block with built in leakage current protection

Description	Rated Current mA	Wavelength nm	Luminance mcd	Catalog number	Weight oz.
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LED blocks, cont.

Lamp block with one diode chip integrated into lamp block. Choose the same color for the LED and the lamp cap or else use a clear cap.

Rated voltage 380 V, AC

Red	10.2	620	250	MLBL-08R	0.42
Green	10.2	520	1500	MLBL-08G	0.42
Yellow	10.2	582	300	MLBL-08Y	0.42
Blue	9.1	468	450	MLBL-08L	0.42
White	9,1	¹⁾	600	MLBL-08W	0.42

Rated voltage 415 V, AC

Red	11.2	620	280	MLBL-09R	0.42
Green	11.2	520	1800	MLBL-09G	0.42
Yellow	11.2	588	350	MLBL-09Y	0.42
Blue	9,9	468	500	MLBL-09L	0.42
White	9,9	¹⁾	650	MLBL-09W	0.42

Note: Care should be taken for DC supply where + and - must be correctly connected. This is marked X1 (+) and X2 (-) on the product.

¹⁾ X=0.31, Y=0.32 according to the ICI Chromaticity Diagram.

Rear mounted LED blocks can be found on page 7.62.

Accessories



DIN-rail adaptor



Dummy block



30mm adaptors



Adaptor



30mm gasket



Lamp changing tool



Mounting tool



Mounting tool for power tool



Blanking plugs



Square bezels

Description	Catalog number	Weight oz.
DIN-rail Adaptor		
DIN-rail adaptor	MA1-8131	0.71
DIN-rail (adaptor) kit with one dummy block	MA1-8001	0.99

NOTE: Use with base mount blocks.

Dummy block

Dummy block, rear mount	MDB-2	0.11
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Dummy blocks are used when only one contact block or a compact device is used together with the DIN-Rail Adaptor

30 mm Adaptors for 22 mm operator (1.5-4 mm panels)

For Emergency stop pushbutton ①

Black plastic	KA1-8027	0.25
Metal	KA1-8028	0.74

For pushbuttons, selector switches, pilot lights, potentiometers and buzzers:

Black plastic	KA1-8029	0.35
Metal	KA1-8030	1.2

Flush mounted adaptors (metal)

For pushbuttons	KA1-8073	1.8
For Selector switches	MA1-8074	1.8

30mm Gasket

For 30mm adaptors for 22mm operator	1SFA616920R8019	
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Lamp changing tool

For LED bulbs and for bulbs	KA1-8072	0.071
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Mounting tool for operator

Mounting tool for tightening the locking nut	MA1-8015	0.74
Mounting tool for power tool	MA1-8149	5.5

Extra key

Ronis 455 (key code 71)	SK616021-71	0.25
Ronis 421 (key code 72)	SK616021-72	0.25
Ronis 3433-E (key code 73)	SK616021-73	0.25

Locking nut

Locking nut 22mm	MA1-8019	0.035
Locking nut 30mm w/22mm device	MA1-8134	

The Locking nut can also be used with Compact Devices.

Blanking plug

Grey, 22mm	MA1-8129	0.18
Light grey, 22mm	MA1-8136	0.18
Black, 22mm	MA1-8130	0.18
Black, 30mm	MA1-8133	0.18

Square bezel

Black, plastic	SK616016-2	0.035
Grey, plastic	MA1-8124	0.035

① Illuminated pushbuttons and pilot lights must use white insert.

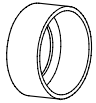
② For extended pushbuttons, insert "E" at the end of the catalog number. For also in MBP and MPD only insert "P" at end of the catalog number.

Accessories



Protective membrane

Description	Catalog number	Weight oz.
Protective membrane		
For flush button	KA1-8052	0.071
For extended button	KA1-8002	0.071
For double pushbutton	MA1-8126	0.071



Protective ring



Protective cover

Protective ring

Operator for protective ring	SK615512-1	0.071
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Note: For flush and extended pushbuttons. To prevent accidental operation. Cannot be used together with Legend plate holder

Protective cover

Protective cover	KA1-8010	0.28
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Note: For flush pushbutton. To prevent accidental operation. Cannot be used together with Legend plate holder.



Bezel

Bezel

For pushbutton

Grey plastic	KA1-8079	0.071
black plastic	KA1-8022	0.071
Chrome metal	KA1-8021	0.53

For Selector switch

Grey plastic	KA1-8077	0.035
black plastic	KA1-8080	0.035
Chrome metal	KA1-8024	0.35



Shroud for emergency stop

Shroud for emergency stop

Yellow	MA1-8053	0.71
Grey	MA1-8128	0.71

Note: For 40 mm Emergency stop pushbuttons and machine stop pushbuttons. To prevent accidental operation. With anti rotation tabs and slot for pad-lock and with water drainage. Not for use with plastic enclosures.



Lockable shroud

Shroud for pilot devices

Lockable shroud	MA1-8153	0.023
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Touch guard

Touch guard for pushbuttons

Touch guard	MA1-8152	0.009
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Accessories Lenses



Lens for Pilot light

Description	Catalog number	Weight oz.
Lenses for pilot lights		
Red	KA1-8031	0.071
Green	KA1-8032	0.071
Yellow	KA1-8033	0.071
Blue	KA1-8034	0.071
White	KA1-8035	0.071
Clear	KA1-8038	0.071
Fresnel light diffusion lens ①	KA1-8005	0.071



Flush lens for pushbutton

Lenses for non-Illuminated pushbuttons

Flush – opaque

Red	KA1-8081	0.53
Green	KA1-8082	0.53
Yellow	KA1-8083	0.53
Blue	KA1-8084	0.53
White	KA1-8085	0.53
Black	KA1-8086	0.53
Grey	KA1-8087	0.53
Clear	KA1-8088	0.53



Extended lens for pushbutton

Extended - opaque

Red	KA1-8091	0.88
Green	KA1-8092	0.88
Yellow	KA1-8093	0.88
Blue	KA1-8094	0.88
White	KA1-8095	0.88
Black	KA1-8096	0.88
Grey	KA1-8097	0.88
Clear	KA1-8098	0.88

Lenses for illuminated pushbuttons

Flush – transparent


Red	KA1-8101	0.53
Green	KA1-8102	0.53
Yellow	KA1-8103	0.53
Blue	KA1-8104	0.53
White	KA1-8105	0.53
Clear	KA1-8108	0.53

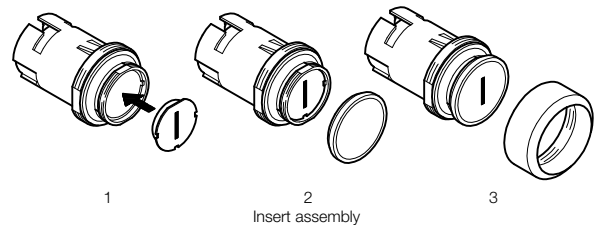
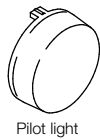
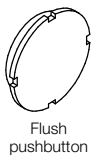
Extended - transparent

Red	KA1-8111	0.88
Green	KA1-8112	0.88
Yellow	KA1-8113	0.88
Blue	KA1-8114	0.88
White	KA1-8115	0.88
Clear	KA1-8118	0.88

① Light diffusing lens insert is placed between the bulb and the lens.

Text cap inserts

Legend	Cap color ①	Suffix code ②	Flush button catalog number	Extended button catalog number	Pilot light catalog number
	White	C82	1SFA616901R9036	—	—
Start	White	C67	1SFA616901R2030	1SFA616902R2030	1SFA616903R2030
START	Green	C5	1SFA616906R1042	—	—
	Black	C81	1SFA616908R1042	—	—
On	White	C68	1SFA616901R1020	1SFA616902R1020	1SFA616903R1020
ON	White	C69	1SFA616901R1039	—	1SFA616903R1039
	Green	C70	1SFA616906R1039	—	—
	Black	C1	1SFA616908R1039	—	—
Off	White	C71	1SFA616901R1019	1SFA616902R1019	1SFA616903R1019
OFF	White	C72	—	1SFA616902R1040	—
	Red	C73	—	1SFA616905R1040	—
	Black	C2	1SFA616908R1040	1SFA616909R1040	—
Stop	White	C74	1SFA616901R1031	1SFA616902R1031	1SFA616903R1031
STOP	Red	C4	1SFA616904R1047	1SFA616905R1047	—
Reset	White	C75	1SFA616901R1025	1SFA616902R1025	1SFA616903R1025
Blank	White	C15	1SFA616901R9000	1SFA616902R9000	1SFA616903R9000
	Green	CG	29491468-2	29491469-2	—
UP	Green	C11	1SFA616906R1043	—	—
DOWN	Green	C12	1SFA616906R1044	—	—
OPEN	White	C16	1SFA616901R1045	—	—
	Green	C19	1SFA616906R1045	—	—
CLOSE	White	C17	1SFA616901R1046	—	—
	Green	C20	1SFA616906R1046	—	—
REV	Green	C6	1SFA616906R1048	—	—
FWD	Green	C7	1SFA616906R1049	—	—
SLOW	Green	C8	1SFA616906R1050	—	—
FAST	Green	C9	1SFA616906R1051	—	—
JOG	Green	C10	1SFA616906R1052	—	—
RESET	Black	C3	1SFA616908R1041	—	—
LATCH	White	C18	1SFA616901R1053	—	—



① Illuminated pushbuttons and pilot lights must use white insert.
② Add suffix code to end of the catalog number.

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 ² /AWG 20 max. 2 x 2.5 mm ² /2 x AWG14
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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.

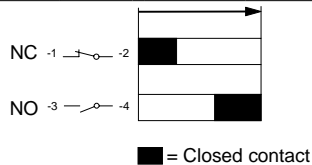
pushbutton, Toggle Switch, Mushroom pushbutton, Double pushbutton, Selector Switch, Key-operated Selector Switch and Emergency Stop Operator	6
Joystick	8

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 Toggle Switch		100 000 operations 1 million operations
Joystick		500 000 operations
		400 000 operations
		300 000 operations