



Short form Catalog

Pilot devices

Products for industrial environments

Unique benefits from ABB pilot devices



L-Mark

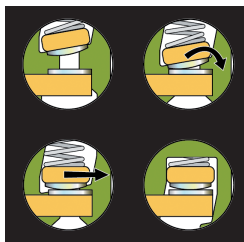
L-mark - Makes customer specific marking easy

A new system for custom marking our pilot devices is now available. In addition to engraving legend plates, ABB can now laser-etch our entire pilot device offering as well. The customer will receive a reference number for the marking from the L-mark webpage, where it also will be stored, making reordering simple, and ensuring that our customers receive their preferred marking every time they order.

Create a customer specific marking online using a five step marking tool:

Visit: <http://bolservices.it.abb.com/pilot-devices>

1. Find your product by typing the type or order code
2. Choose between text or symbol marking
3. Choose your preferred marking layout
4. Type marking or choose any of our 3000 symbols including the ISO 7000 library
5. Order by the order code + ref. code provided on the site Example: Order code:1SFA61130L1101 (order code always with a L instead of a R) type code:MPD1-11R-L Reference number:MUE979



Wiping action

Wiping action

The contact blocks for both compact and modular devices feature self-cleaning contacts thanks to a built in wiping action. At operation the moving contact rolls over and slides sideways when touching the fixed contact. This feature ensures a good clean contact function also in low energy applications.



Easy installation

Fast and easy installation

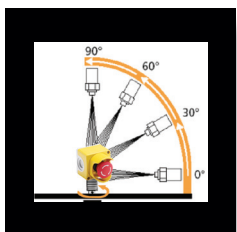
All ABB pilot devices are easy to install. Spring-loaded tabs ensure that actuators and legend plates are in the correct position. Our actuators can be used in both notched and round holes. The modular snap-on design provides one of the fastest assemblies on the market. See picture to the left.



IP67

IP67

Our Entire compact line and parts of modular are approved according to IP67. This means that the product is protected against the effects of temporary immersion in water one meter down for 30 min. This gives a water-proof enclosure for tough environments.



IP69K

IP69K

The IP69K test specification was initially developed for road vehicles, especially those that need regular intensive cleaning (dump trucks, cement mixers, etc.), but also finds use in other areas (e.g., food industry).

Our entire compact line and parts of the modular line are approved according to IP69K. The standard requires the water pressure to be 100 bar, at a rate of about 15 l/minute, and at a temperature of 80 °C. The nozzle from which the water is sprayed is 10 cm from the product. The spray is applied at the angles of 0 °, 30 °, 60 °, and 90 °, during 40 seconds at each angle, while the product is rotated at 5 rpm.

Emergency stops award winning design



Get prepared with ABB

Choosing the right emergency stop device is critical in order to guarantee the safety of your personnel and equipment. ABB has a very wide range of emergency stops which all fulfill IEC 60947-5-5 the standard for emergency stop devices.

Best product award

Our emergency stop series was awarded "Best Product" by the well known magazine P&A, in the category "Ex-shutz & sicherheit" voted by the magazine's readers.

Modular range

This range includes operators, holders, contact blocks and accessories that can be combined with high flexibility. The latest design has a green line added to indicate that the emergency stop is not actuated.

Compact range

The compact range has all functions built-in in one single unit.

Accessories

- Emergency stop shroud
- Enclosures
- Legend plates



Compact range

Order example:

Ex 1: Type CP1-10-10, to order color red replace ■ with R: CP1-10 R-10

Ex 2: Order code 1SFA619100R101□

To order color red replace □ with 1: 1SFA619100R1011

Bezel - How to order

Black - Standard

Chrome metal - Replace '1' with '3' in Type and Order Codes



Bezel options	Type	Order code
Black plastic	CP(X)-10X-XX	1SFA619 X0X R10XX
Chrome metal	CP(X)-30X-XX	1SFA619 X0X R30XX

Color codes

	Red	Green	Yellow	Blue	White	Black	Grey	Clear
Type ■	R	G	Y	L	W	B	U	C
Order Code □	1	2	3	4	5	6	7	8



Flush pushbutton

Type	Flush pushbutton		Extended pushbutton	
	Type	Order Code	Type	Order Code
1 NO	CP1-10-10	1SFA619100R101□	CP2-10-10	1SFA619101R101□
2 NO	CP1-10-20	1SFA619100R102□	CP2-10-20	1SFA619101R102□
1 NC	CP1-10-01	1SFA619100R104□	CP2-10-01	1SFA619101R104□
2 NC	CP1-10-02	1SFA619100R105□	CP2-10-02	1SFA619101R105□
1 NO+1 NC	CP1-10-11	1SFA619100R107□	CP2-10-11	1SFA619101R107□



Illuminated pushbutton with integrated LED. Flush or extended lens*

Type	24 V, AC/DC Momentary	110-130 V, AC/DC Momentary	220 V, AC/DC Momentary	
1 NO flush	CP1-11-10	1SFA619100R111□	CP1-13-10	1SFA619100R131□
1 NC flush	CP1-11R-01	1SFA619100R1141	CP1-13R-01	1SFA619100R1341
1 NO extended	CP3-11-10	1SFA619102R111□	CP3-13-10	1SFA619102R131□
1 NC extended	CP3-11R-01	1SFA619102R1141	CP3-13R-01	1SFA619102R1341
Type	24 V, AC/DC Maintained	110-130 V, AC/DC Maintained	220 V, AC/DC Maintained	
1 NO flush	CP2-11-10	1SFA619101R111□	CP2-13-10	1SFA619101R131□
1 NC flush	CP2-11R-01	1SFA619101R1141	CP2-13R-01	1SFA619101R1341
1 NO extended	CP4-11-10	1SFA619103R111□	CP4-13-10	1SFA619103R131□
1 NC extended	CP4-11R-01	1SFA619103R1141	CP4-13R-01	1SFA619103R1341



* Available 2011

Pilot light with integrated LED

Type	24 V, AC/DC	110-130 V, AC	220 V, DC	230 V, AC			
CL-502	1SFA619402R502□	CL-513	1SFA619402R513□	CL 520	1SFA619402R520□	CL 523	1SFA619402R523□



Selector switch

Type	Maintained / Two-positions	Maintained / Two-positions	Momentary / Two-positions			
1 NO	C2SS1-10-10	1SFA619200R101□	C2SS2-10-10	1SFA619201R101□	C2SS3-10-10	1SFA619202R101□
2 NO	C2SS1-10-20	1SFA619200R102□	C2SS2-10-20	1SFA619201R102□	C2SS3-10-20	1SFA619202R102□
1 NO+1 NC	C2SS1-10-11	1SFA619200R107□	C2SS2-10-11	1SFA619201R107□	C2SS3-10-11	1SFA619202R107□
Type	Maintained / Three-positions	Maintained / Three-positions	Momentary / Three-positions			
2 NO	C3SS1-10-20	1SFA619210R102□	C3SS2-10-20	1SFA619211R102□	C3SS3-10-20	1SFA619212R102□
1 NO+1 NC	C3SS1-10-11	1SFA619210R107□	C3SS2-10-11	1SFA619211R107□	C3SS3-10-11	1SFA619212R107□

Compact range



Compact product features

- "All-in-one design"
- IP66, 67, 69K & UL Type 1, 3R, 4, 4X, 12, 13
- Easy mounting
- Reduced inventory levels
- Operator style identical to modular range
- Wiping action
- Metal and plastic bezel option

Emergency stop							
●							
		Type	Order Code	Type	Order Code	Type	Order Code
		Twist release		Pull release		Key release: Ronis 455, key code 71	
1 NC	∅ 30 mm	CE3T-10R-01	1SFA619500R1041				
2 NC	∅ 30 mm	CE3T-10R-02	1SFA619500R1051	CE3P-10R-02	1SFA619501R1051	CE3K1-10R-02	1SFA619502R1051
1NO+1NC	∅ 30 mm	CE3T-10R-11	1SFA619500R1071	CE3P-10R-11	1SFA619501R1071	CE3K1-10R-11	1SFA619502R1071
1 NC	∅ 40 mm	CE4T-10R-01	1SFA619550R1041				
2 NC	∅ 40 mm	CE4T-10R-02	1SFA619550R1051	CE4P-10R-02	1SFA619551R1051	CE4K1-10R-02	1SFA619552R1051
1NO+1NC	∅ 40 mm	CE4T-10R-11	1SFA619550R1071	CE4P-10R-11	1SFA619551R1071	CE4K1-10R-11	1SFA619552R1071



Machine stop							
●							
		Twist release		Pull release		Key release: Ronis 455, Key code 71	
1NO+1NC	∅ 30 mm	CE3T-10B-11	1SFA619500R1076	CE3P-10B-11	1SFA619501R1076	CE3K1-10B-11	1SFA619502R1076
1NO+1NC	∅ 40 mm	CE4T-10B-11	1SFA619550R1076	CE4P-10B-11	1SFA619551R1076	CE4K1-10B-11	1SFA619552R1076



Mushroom							
● ● ● ●							
		Momentary					
1NO+1NC	∅ 40 mm	CPM3-10■-11	1SFA619126R107□				



Assembled compact emergency stop enclosures			
1-seat plastic enclosure (yellow)			
■ □	Twist release. Red button 2 NC	CEPY1-1001	1SFA619821R1001
■ □	Pull release. Red button 2 NC	CEPY1-1002	1SFA619821R1002
Emergency stop enclosure with shroud			
■ □	Twist release. Red button 2 NC	CEPY1-2002	1SFA619821R2002
■ □	Pull release. Red button 2 NC	CEPY1-2001	1SFA619821R2001

Assembled compact machine stop enclosures			
1-seat plastic enclosure with black mushroom pushbutton (dark grey)			
■ □	Twist release. Black button 1 NO + 1 NC	CEP1-1001	1SFA619811R1001
■ □	Pull release. Black button 1 NO + 1 NC	CEP1-1002	1SFA619811R1002
Machine stop enclosure with shroud			
■ □	Twist release. Black button 1 NO + 1 NC	CEP1-2001	1SFA619811R2001
■ □	Pull release. Black button 1 NO + 1 NC	CEP1-2002	1SFA619811R2002

Modular range

Modular product features

- Widest range of integrated LED:s on the market.
- Parts of Range IP 67, 69K. All range IP 66 & UL Type 1, 3R, 4, 4X, 12, 13.
- Snap-on feature reduces installation time.
- Quick release contact holder.
- Several bezel colors.
- Unique low energy solutions, including wiping action.



Bezel - How to order

Black - Standard
 Chrome metal - Replace '1' with '3' in Type and Order Codes



Bezel options	Type	Order code
Black plastic	CP(X)-10X-XX	1SFA619 X0X R10XX
Chrome metal	CP(X)-30X-XX	1SFA619 X0X R30XX

How to order standard operators:	Color codes			Contact blocks including holder with 3 blocks		
	Description	Type ■	Order Code □	Description	Type	Order Code
<ul style="list-style-type: none"> • Non-illuminated operator + holder + contact block(s) • Illuminated operator + holder + contact block(s) + lamp block 	● Red	R	1	1 NO	MCBH-10	1SFA611605R1101
	● Green	G	2	1 NC	MCBH-01	1SFA611605R1110
	● Yellow	Y	3	2 NC	MCBH-02	1SFA611605R1120
	● Blue	L	4	2 NO	MCBH-20	1SFA611605R1102
	○ White	W	5	1 NO+1 NC	MCBH-11	1SFA611605R1111
	● Black	B	6	1 NO+2 NC	MCBH-12	1SFA611605R1121
	● Grey	U	7	Contact blocks		
	○ Clear	C	8	1 NO	MCBH-10	1SFA611610R1001
				1 NC	MCBH-01	1SFA611610R1010
				Separate holder for 3 blocks		
				Holder	MCBH-00	1SFA611605R1100

Ordering example:

Ex 1: Type CP1-10■-10, to order color red replace ■ with R: CP1-10 R-10

Ex 2: Order code 1SFA619100R101□, to order color red replace □ with 1: 1SFA619100R1011



Emergency stop pushbutton								
●	Type	Order Code	Type	Order Code	Type	Order Code	Type	Order Code
	Ø 30 mm / Non-illuminated		Ø 40 mm / Non-illuminated		Ø 40 mm / Illuminated		Ø 60 mm / Illuminated	
Twist release	MPET3-10R	1SFA611520R1001	MPET4-10R	1SFA611523R1001	MPMT3-11R	1SFA611510R1101	MPMT4-11R	1SFA611513R1101
Pull release	MPEP3-10R	1SFA611521R1001	MPEP4-10R	1SFA611524R1001	MPMP3-11R	1SFA611511R1101	MPMP4-11R	1SFA611514R1101
Key release	MPEK3-11R	1SFA611522R1101	MPEK4-11R	1SFA611525R1101				



Machine stop pushbutton				
●	Ø 30 mm		Ø 40 mm	
Twist release	MPET3-10B	1SFA611520R1006	MPET4-10B	1SFA611523R1006
Pull release	MPEP3-10B	1SFA611521R1006	MPEP4-10B	1SFA611524R1006
Key release	MPEK3-10B	1SFA611522R1106	MPEK4-10B	1SFA611525 R1061



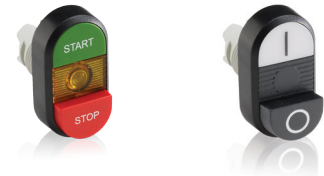
Mushroom pushbutton								
Colors	Ø 40 mm / Non-illuminated		Ø 60 mm / Non-illuminated		Ø 40 mm / Illuminated		Ø 60 mm / Illuminated	
● Red	MPM1-10R	1SFA611124R1001	MPM2-10R	1SFA611125R1001	MPM1-11R	1SFA611124R1101	MPM2-11R	1SFA611125R1101
● Green	MPM1-10G	1SFA611124R1002			MPM1-11G	1SFA611124R1102		
● Yellow	MPM1-10Y	1SFA611124R1003	MPM2-10Y	1SFA611125R1003	MPM1-11Y	1SFA611124R1103	MPM2-11Y	1SFA611125R1103
● Black	MPM1-10B	1SFA611124R1006	MPM2-10B	1SFA611125R1006				

Lampblocks - see accessories

Modular range



Flush button				Extended button				
● ● ● ● ● ○ ● ○	Type	Order Code	Type	Order Code	Type	Order Code	Type	Order Code
	Non-illuminated		Illuminated		Non-illuminated		Illuminated	
Momentary	MP1-10■	1SFA611100R100□	MP1-11■	1SFA611100R110□	MP3-10■	1SFA611102R100□	MP3-11■	1SFA611102R110□
Maintained	MP2-10■	1SFA611101R100□	MP2-11■	1SFA611101R110□	MP4-10■	1SFA611103R100□	MP4-11■	1SFA611103R110□



Double pushbutton					
● Upper ● Lower	Extended lower button / Non-illuminated		Extended lower button / Illuminated		○ Upper Extended lower button / ● Lower Non-illuminated
I/O	MPD13-11B	1SFA611142R1106	MPD13-11C	1SFA611142R1108	- 1SFA611146R1106
START / STOP	MPD15-11B	1SFA611144R1106	MPD15-11C	1SFA611144R1108	



Selector switch									
Three-positions									
●	Short handle		⚙	Short handle		⚙	Long handle		⚙
Black plastic	M3SSC1-10B	1SFA611250R1006	M3SSC3-10B	1SFA611252R1006	M3SSC4-10B	1SFA611253R1006	M3SSC6-10B	1SFA611255R1006	
Chrome metal	M3SSC1-30B	1SFA611250R3006	M3SSC3-30B	1SFA611252R3006	M3SSC4-30B	1SFA611253R3006	M3SSC6-30B	1SFA611255R3006	
Two-positions									
● ● ●	Maintained / Short handle		⚙	Momentary / Short handle		⚙	Maintained / Long handle		⚙
	M2SS1-10■	1SFA611200R100□	M2SS3-10■	1SFA611202R100□	M2SS4-10■	1SFA611203R100□			
Two-positions, illuminated									
● ● ● ● ● ○	Maintained / Short handle		⚙	Maintained / Short handle		⚙	Momentary / Short handle		⚙
	M2SS1-11■	1SFA611200R110□	M2SS2-11■	1SFA611201R110□	M2SS3-11■	1SFA611202R110□	M2SS4-11■	1SFA611203R110□	



Key operated selector switch									
●	Maintained / Two positions*		⚙	Maintained / Two positions*		⚙	Momentary / Two positions		⚙
71/Ronis 455	M2SSK1-101	1SFA611280R1001	M2SSK2-101	1SFA611281R1001	M2SSK3-101	1SFA611282R1001	M3SSK1-101	1SFA611283R1001	
72/Ronis 421	M2SSK1-102	1SFA611280R1002	M2SSK2-102	1SFA611281R1002	M2SSK3-102	1SFA611282R1002	M3SSK1-102	1SFA611283R1002	
73/Ronis 3433-E	M2SSK1-103	1SFA611280R1003	M2SSK2-103	1SFA611281R1003	M2SSK3-103	1SFA611282R1003	M3SSK1-103	1SFA611283R1003	

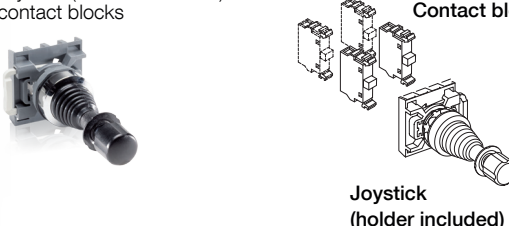
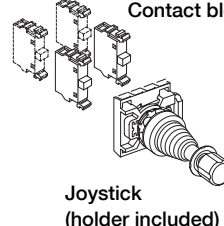
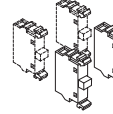
* Key release in B-position only



Pilot lights		
● ● ● ● ● ○	ML1-100■	1SFA611400R100□
Light diffusing lens	KA1-8005	1SFA616920R8005

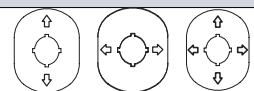
Lampblocks - see accessories

Modular range

How to order Joystick & Extreme duty Pushbuttons:			Color codes			Contact blocks including holder with 3 blocks				
<ul style="list-style-type: none"> Joystick (holder included) + contact blocks 		Contact blocks 	Description	Type ■	Order Code □	Description	Type	Order Code		
			<ul style="list-style-type: none"> Red Green Yellow Blue White Black Grey Clear 	<ul style="list-style-type: none"> R G Y L W B U C 	<ul style="list-style-type: none"> 1 2 3 4 5 6 7 8 	Contact blocks <ul style="list-style-type: none"> 1 NO 1 NC 	<ul style="list-style-type: none"> MCB-10 MCB-01 	<ul style="list-style-type: none"> 1SFA611610R1001 1SFA611610R1010 		
						Micro switch blocks <ul style="list-style-type: none"> 1 NO 1 NC 			<ul style="list-style-type: none"> MCBL-10 MCBL-01 	<ul style="list-style-type: none"> 1SFA611612R1010 1SFA611612R1001



Joystick								
●	Type	Order Code	Type	Order Code	Type	Order Code	Type	Order Code
	Maintained		Spring return		Maintained / Latching function		Spring return / Latching function	
2 - position	MJS1-60B	1SFA611701R6006	MJS2-60B	1SFA611702R6006	MJS7-60B	1SFA611707R6006	MJS8-60B	1SFA611708R6006
4 - position	MJS5-60B	1SFA611705R6006	MJS6-60B	1SFA611706R6006	MJS11-60B	1SFA611711R6006	MJS12-60B	1SFA611712R6006

Legend plates for joystick			
2 - position	MA6-1240	1SFA611930R1240	
2 - position	MA6-1241	1SFA611930R1241	
4 - position	MA6-1242	1SFA611930R1242	

Other options on next page



Extreme duty pushbutton		
● ● ●	For Ø 30 mm mounting hole	
KP6-40■	1SFA616105R400 □	






Reset pushbutton						
● ○	With shaft	Without shaft		Accessories: Shaft (black)		
No text	KPR3-100■	1SFA616162R100 □	KPR1-100■	1SFA616160R100 □	KA1-8046	1SFA616920R8046



Buzzer								
●	12 V AC/DC		24 V AC/DC		115 V AC/DC		230 V AC	
Continuous	KB1-4000	1SFA616401R4000	KB1-4010	1SFA616401R4010	KB1-4030	1SFA616401R4030	KB1-4040	1SFA616401R4040
Pulsating	KB1-4100	1SFA616401R4100	KB1-4110	1SFA616401R4110	KB1-4130	1SFA616401R4130	KB1-4140	1SFA616401R4140



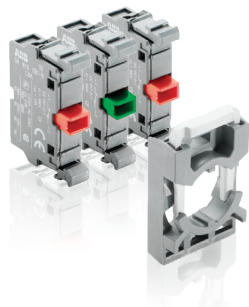
Potentiometer									
●	with resistor 5 kohm		with resistor 10 kohm		with resistor 50 kohm		1)	2)	3)
Black plastic	MT-105B	1SFA611410R1056	MT-110B	1SFA611410R1106	MT-150B	1SFA611410R1506			
Legend plates	1) SK615562-87		2) SK615562-88		3) 1SFA611930R1252				



Toggle switch*						
●	Maintained / Two-positions		Momentary / Three-positions		Maintained / Three-positions	
Black plastic	MTS1-10B	1SFA611300R1006	MTS2-10B	1SFA611301R1006	MTS3-10B	1SFA611302R1006
Chrome metal	MTS1-30B	1SFA611300R3006	MTS2-30B	1SFA611301R3006	MTS3-30B	1SFA611302R6006

* See contact block configuration for standard operator

Accessories



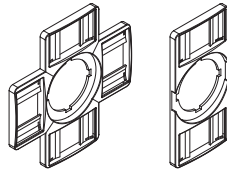
Blocks and holder



Micro switch block



LED lamp block with built in leakage curragge protection



Legend plate holders for joystick



Legend plate holders



Legend plate holder for double pushbutton



30 mm adaptor



Protectice cover

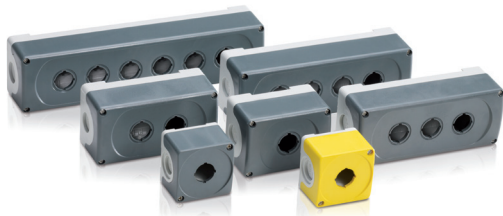


Mounting tool



Membrane of silicon rubber

Enclosures



Empty enclosures



DIN-rail adaptor

Separate holder			
Description	Type	Order Code	Min. order qty
Holders for three blocks	MCBH-00	1SFA611605R1100	10
Contact blocks			
1 NO	MCB-10	1SFA611610R1001	10
1 NC	MCB-01	1SFA611610R1010	10
Micro switch blocks			
1 NO	MCBL-10	1SFA611612R1010	10
1 NC	MCBL-01	1SFA611612R1001	10
Contact blocks with 3-blocks holder included			
1 NO	MCBH-10	1SFA611605R1101	1
1 NC	MCBH-01	1SFA611605R1110	1
2 NC	MCBH-02	1SFA611605R1120	1
2 NO	MCBH-20	1SFA611605R1102	1
1 NO + 1 NC	MCBH-11	1SFA611605R1111	1
2 NO + 1 NC	MCBH-21	1SFA611605R1112	1
Lamp blocks with integrated LED			
Colors ● ● ● ● ● (see previous pages for color code ordering info)			
Rated voltage 24 V, AC/DC	MLBL-01	1SFA611621R101	10
Rated voltage 110-130 V, AC	MLBL-04	1SFA611621R104	10
Rated voltage 110-130 V, DC	MLBL-05	1SFA611621R105	10
Rated voltage 220 V, DC	MLBL-06	1SFA611621R106	10
Rated voltage 230 V, AC	MLBL-07	1SFA611621R107	10
Legend plate holders			
Legend plate holder (4-pos. joystick)	MA1-8137	1SFA611920R8137	1
Legend plate holder (2-pos. joystick)	MA1-8138	1SFA611920R8138	1
Legend plate holder (2-pos. double)	MA1-8039	1SFA611920R8039	1
Legend plate holder (black)	KA1-8120	1SFA616920R8120	10
Inserts without text	KA1-8121	1SFA616920R8121	10
Legend plate holder for plastic enclosure	MA6-1060	1SFA611930R1060	10
Inserts without text for plastic enclosure	MA6-1061	1SFA611930R1061	10
Accessories			
Mounting tool	MA1-8015	1SFA611920R8015	1
Membrane of silicone flush button	KA1-8052	1SFA611920R8052	1
Membrane of silicone extended button	KA1-8002	1SFA611920R8002	1
Locking nut	MA1-8019	1SFA611920R8019	10
Light diffusing lens	KA1-8005	1SFA611920R8005	1
Adaptors 30 mm black plastic	KA1-8029	1SFA611920R8029	1
Protective cover	KA1-8010	1SFA611920R8010	1
Spacer*	-	SK615516-1	1
Spacer for modular emergency stop*	KA1-8045	1SFA616920R8045	1

*Spacer is needed when legendplates are not used in plastic enclosures

Empty plastic enclosures for modular and compact range			
Description	Type	Order Code	Min. order qty
■ ■ 1-seat	MEPY1-0	1SFA611821R1000	1
■ ■ 1-seat	MEP1-0	1SFA611811R1000	1
■ ■ 2-seat	MEP2-0	1SFA611812R1000	1
■ ■ 3-seat	MEP3-0	1SFA611813R1000	1
■ ■ 4-seat	MEP4-0	1SFA611814R1000	1
■ ■ 6-seat	MEP6-0	1SFA611816R1000	1
Shroud			
■ Yellow	MA1-8053	1SFA611920R8053	1
■ Grey	MA1-8128	1SFA611920R8128	1
Empty enclosures for compact range			
■ ■ Yellow/Light grey	CEPY1-0	1SFA619821R1000	1
■ ■ Dark grey/Light grey	CEP1-0	1SFA619811R1000	1
Shroud			
■ Yellow	CA1-8053	1SFA619920R8053	1
■ Grey	CA1-8054	1SFA619920R8054	1
DIN-rail adaptor			
DIN-rail adaptor	MA1-8131	1SFA 611 920 R8131	1

Technical data compact range

Standard 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 - Electro-mechanical 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
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		
Pilot device:	IEC/EN DIN	UL/CSA
Pushbutton	IP66, IP67 and IP69K	Type 1, 3R, 4, 4X, 12, 13
Selector switch	IP66, IP67 and IP69K	Type 1, 3R, 4, 4X, 12, 13
Pilot light	IP66, IP67 and IP69K	Type 1, 3R, 4, 4X, 12, 13
Emergency stops	IP66, IP67 and IP69K	Type 1, 3R, 4, 4X, 12, 13
Terminals	IP20	
Temperature		
Ambient temperature during operation	-25 to +70 °C	
Storage temperature	-40 to +85 °C	

Technical data	
Cable connections	
Operator	Cable terminal
Pushbutton	Plus-minus Pozidriv No. 2
Selector switch	Connectable area:
Emergency stop	min. 1 x 0.5 mm ² /1 x AWG22 max. 2 x 1.5 mm ² /2 x AWG14
Tightening torque	
Operators, M22	Min. 2 Nm / Max. 2.3 Nm
Pushbutton and selector switch	Cable terminals M3, 0.8 Nm
Pilot light	Cable terminals M3.5, 0.9 Nm
Emergency stop	Cable terminals M3, 0.8 Nm

Electrical data			
Electrical ratings			
Contacts			
Ratings as per IEC 60947-5-1			
Rated insulation voltage, U _i		300 V	
Rated thermal current, I _{th}		5 A	
Rated operational current, I _o utilisation category AC-15	at: 240 V	1 A	
Rated operational current, I _o utilization category DC-13,	at: 24 V at: 125 V	0.3 A 0.2 A	
Ratings as per UL, CSA, NEMA		C300 AC	R300 DC
Rated insulation voltage		250 V	250 V
Rated thermal current		2.5 A	1 A
Rated operational current	at: 120 V at: 125 V at: 240 V at: 250 V	1.5 A 0.75 A	0.22 A 0.11 A
Short circuit protection			
Max. fuse at 1 kA		gG 10A	

Make-and-break contacts	
Pushbutton	Emergency stop pushbutton
■ = Closed contact	■ = Closed contact

LED's (for both compact and modular)	
Service life for LED's means number of service hours until the brightness has been reduced down 50 %. Service life 50 000 h	
White LED's	x=0.31 Y=3.2 means the position of color in the ICI Chromaticity Diagram
Over voltage on LED's	10 % overvoltage is acceptable without affecting the service life
Voltage peaks on LED's	Voltage peaks up to 1000 V Current peaks up to 500 mA during a few msec
Gloaming light	All integrated LEDs have a function built in to cut leakage currents

Mechanical data	
Mechanical life	
Pushbuttons, selector switches	500 000 operations
Emergency stop pushbutton	50 000 operations

Technical data modular range

Standard 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
UL 508	Industrial Control Equipment
CSA C22.2 No 14	Industrial Control Equipment

Environmental data		
Degrees of protection		
Operators	IEC/EN	UL/CSA
Pushbutton	IP 66	Type 1, 3R, 4, 4X, 12, 13
Double pushbutton	IP 66	Type 1, 3R, 4, 4X, 12, 13
Mushroom	IP 66	Type 1, 3R, 4, 4X, 12, 13
Emergency stop	IP 66	Type 1, 3R, 4, 4X, 12, 13
Selector switch	IP 66	Type 1, 3R, 4, 4X, 12, 13
Key operated selector switch	IP 66	Type 1, 3R, 4, 4X, 12
Toggle switch	IP 66	Type 1, 3R, 4, 4X, 12, 13
Extreme duty pushbutton	-	Type 1, 3R, 4, 4X
Reset button	IP 66	Type 1, 3R, 4, 4X, 12, 13
Joystick	IP 66, 67, 69K	Type 1, 4X (indoor), 12, 13
Pilot lights	IP 66	Type 1, 3R, 4, 4X, 12, 13
Buzzer	IP 65	Type 4X
Potentiometer	IP 66	Type 1, 3R, 4, 4X, 12, 13
Contact block and transformer block	IP 20	-
Plastic enclosures	IP 66	Type 1, 3R, 4, 4X, 12, 13
Metallic enclosures	IP 66, 67, 69K	-

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

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
Tightening torque	
Operators, M22	Min. 2 Nm / Max. 2.3 Nm
Cable terminals	0.9 Nm
Recommended maximum number of blocks: 6	

Electrical data			
Standards contact blocks			
Mechanical endurance	10 million operations		
Self cleaning contacts of silver, NC contact with positive opening. At voltages and currents below 24 V and 5.6 mA we recommended our micro switch blocks or as an alternative, gold plated contacts.			
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 _o utilisation 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 _o 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 functiontest	at: 5V, 16 mA		
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 _o utilisation category AC 14,	at: 125 V	0.5 A	
Rated operational current, I _o utilization category DC 13,	at: 24 V	0.3 A	
Rated operational current, I _o utilization category DC 12,	at: 24 V	0.1 A	
Minimum switching capacity	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	
Short circuit protection			
Max. fuse at 1 kA	gG 16A		
Note: LEDs see technical data compact range			

Mechanical data	
Mechanical life	
Pushbuttons, momentary mushroom	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

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