

Technical information

				Command auxiliaries
Rated insulation voltage	Ui	IEC947-5-1	V	600
Rated thermal current	Ithe	IEC947-5-1	A	10
Rated operating current	IEC947-5-1/EN60947-5-1			
Category AC15	le	230 V	A	6
		400 V	A	4
		500 V	A	3
Category DC13	le	24 V	A	6
		250 V	A	0,4
Insulation		500 V DC	MΩ	100
Contact resistance	IEC255-7 cat. 3	Initial value	mΩ	25
Insulation strength		50/60 Hz per 1' *	Vca	2500
Protection against short circuits	IEC269 (IEC947-5-1)			
	GI or gG fuse		A	10
Conditional short circuit current	IEC947-5-1		A	100
Pollution degree	IEC947-5-1			3
Command protection degree (EN 60529)	Opaque/illuminated		IP	65
	Dual pushbuttons		IP	40
	Controllers		IP	65
Resistance to vibrations	IEC68-2-6		mm	0,35 ± 15% (10 to 55 Hz ± 1 Hz)
Resistance to shock	IEC68-2-27	11 ms	g	30
Mechanical life	Mushroom and coupling pushbuttons and controllers		cycles	500000
	Selector switches and		cycles	1000000
	Illuminated pushbuttons		cycles	3000000
Electrical life	at 250 V AC 6A with resistant cosφ=1		min cycles	500000
	at 250 V AC 6A with inductive load of cosφ=0,4		min cycles	500000
Distance between contacts	slow action models		mm	2x2
Terminals	type			Screw with combined notch and removable plate
	Screw		M	3,5
	Protection level		IP	20
	Material			Steel class 8.8 / 6-8 micron galvanised iridescent yellow
	Max screw tightening force		N cm (kg cm)	120 (12,24)
	Sections that can be connected	rigid cable	mm²	2x1,5
		flexible cable	mm²	2x1,5
	With prod terminal		mm²	1x1,5
	Terminal numbering			In accordance with EN50013
	Terminal coloring			Red for NC contacts, green for NO contacts

Conditions of use

Ambient temperature	operating	°C	-25 to +70
Relative humidity	operating		95% max
Weather resistance	temperate in accordance with DIN 50014:		23/50
	damp in accordance with DIN 50015:		23/83
	hot humid in accordance with DIN 50015:		40-92
	variable humid in accordance with DIN 50016:		FW24

* Between terminals of the same polarity; between terminals of different polarity; between live metal parts and mass; between live and unpowered metal parts.

Technical information

Definition of the colors in accordance with the specific use

- Provisions laid down by the CEI 16-3, EN60073 and CEI 44-5, and EN60204-1 standards
- Introduction:** when the color alone is insufficient to identify a function, it is useful to make use of one or more complementary methods, such as wording or symbols. For the symbols, see the EI 16-3 and IEC 417 standards. To simplify the choice of colors, some of the provisions set out in the CEI 16-3 and CEI 44-5 standards are set out below.

Colors of the light indicators and their meaning

Color	Meaning	Explanation	Operator action	Examples of application
Red	Emergency	Dangerous conditions	Immediate action to eliminate a dangerous condition (such as an emergency stop)	<input type="checkbox"/> Pressure / temperature outside safety limits <input type="checkbox"/> Voltage drop <input type="checkbox"/> Cut-off <input type="checkbox"/> Limit switch beyond the stop condition
Yellow	Abnormal	Abnormal conditions critical condition imminent	Check and/or action (such as the restoration of the desired function)	<input type="checkbox"/> Pressure / temperature beyond normal limits <input type="checkbox"/> Release of the safety device
Green	Normal	Normal condition	Optional	<input type="checkbox"/> Pressure / temperature within normal limits <input type="checkbox"/> Authorisation to proceed
Blue	Compulsory	Indicates a condition requiring action by the operator	Compulsory action	<input type="checkbox"/> Instruction to enter pre-selected values
White	Neutral	Other conditions – may be used each time there are doubts over the use of the other colours	Check	<input type="checkbox"/> General information

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Illuminated pushbuttons

The illuminated pushbuttons have to be colored in accordance with the code in the tables. The red color used for the emergency stop driver should not depend on its light source.

Colors of the light indicators on the illuminated pushbuttons and their meaning*

Color	Meaning	Explanation	Examples of application
Red	Emergency	Activate in the event of dangerous or emergency conditions	<input type="checkbox"/> Emergency stop <input type="checkbox"/> Start of the emergency function (**)
Yellow	Abnormal	Activate in the event of abnormal conditions	<input type="checkbox"/> Operation to eliminate an abnormal condition <input type="checkbox"/> Operation to restart an interrupted automatic cycle
Green	Safety	Activate in the event of a safety condition or as preparation for a normal condition	(**)
Blue	Compulsory	Activate in the event of a condition that requires compulsory action	<input type="checkbox"/> Reset function
White	No specific meaning	For the general start-up of the functions, with the exception of emergency stop (see note **)	<input type="checkbox"/> Start-up (preferential) <input type="checkbox"/> Stop
Grey			<input type="checkbox"/> Start-up <input type="checkbox"/> Stop
Black			<input type="checkbox"/> Stop <input type="checkbox"/> Start-up (preferential)

(*) When a supplementary coding method is used (such as a special structure, shape or position) to identify the pushbutton drive systems, white, grey or black may be used for a variety of functions (for example, white for the start and stop buttons).

(**) The colors for the start buttons are white and black, with white preferred. Green may also be used. Red should be used for the emergency stop buttons. The colors used for the stop buttons are white and (preferably) black. Red may also be used. Green cannot be used. Red, green and yellow should not be used for pushbuttons that cause start-up or stop, or which cause a function to be performed when they are pressed and a stop when released (pushbuttons held down, for example). Green is reserved for the indication of normal or safety functions. Green should not be used for reset buttons.

30mm diameter non-illuminated operators – Metal



Protected pushbutton

Code	Model	Description
ER510010	30 / PR1	Black operator
ER510020	30 / PR2	Red operator
ER510030	30 / PR3	Green operator
ER510040	30 / PR4	Yellow operator



Protruding pushbutton

Code	Model	Description
ER510090	30 / PS1	Black operator
ER510100	30 / PS2	Red operator
ER510110	30 / PS3	Green operator
ER510120	30 / PS4	Yellow operator



35 diameter push-pull mushroom pushbutton

Code	Model	Description
ER510340	30 / PFBPT1	35 mm dia. black operator
ER510350	30 / PFBPT2	35 mm dia. red operator



Momentary mushroom pushbutton

Code	Model	Description
ER510150	30 / PF2	35 mm dia. red operator
ER510200	30 / PF2-60	60 mm dia. red operator



Rotary release mushroom pushbutton

Code	Model	Description
ER510250	30 / PFB2-40	40 mm dia. red operator
ER510270	30 / PFB4-40	40 mm dia. yellow operator
ER510300	30 / PFB2-60	60 mm dia. red operator



Key release mushroom pushbutton

Code	Model	Description
ER510390	30 / PFBC1	Black operator
ER510400	30 / PFBC2	Red operator

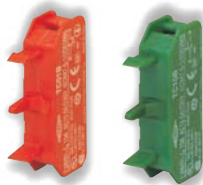
Most pushbuttons are available in: Red, black, green, yellow, white, blue or grey. Contact **CARLO GAVAZZI** for details.

The above parts refer to **ONLY** the **OPERATOR** and **CONTACT HOLDER ELEMENT**. The products may be combined with one or more **CONTACT ELEMENTS** shown on page C47.

- Accessories page **C47**
- Dimensions page **C50**
- Technical information page **C8**

Contact elements for 22 or 30mm diameter operators

Contact elements (*)



Code	Model	Description	
ER520810	C01B	1 NC	
ER520800	C10B	1 NO	

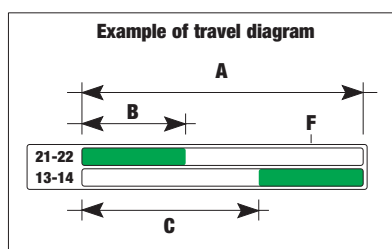
Code	Model	Description	
ER520840	C02	2 NC	
ER520830	C20	2 NO	
ER520820	C11	1 NC + 1 NO	

Zb Contact element in exchange with 4 terminals (the two mobile contacts are electrically separated)



Forced NC contact opening symbol (IEC 947-5-1, section 3)
For switches used in command circuits with safety functions, the safe operation of the NC contact opening is required (see IEC 204, EN 60204)

(*) Slow action contact element



A = maximum driver travel
B = drive travel up to the opening of the 21-22 NC contact
C = drive travel up to the closure of the 13-14 NO contact
F = total travel necessary for complete forced opening

- Dimensions page **C53**
- Technical information page **C8**

30mm diameter operators – Dimensions (mm)

Non-illuminated and illuminated operators

Series	Model	Opaque metal operators	Model	Illuminated metal operators
Flush pushbutton	30/PR...		30/PRL...	
Extended pushbutton	30/PS...		30/PSL...	
Push-pull mushroom pushbutton	30/PFBPT...		30/PFBPTL...	
35 diameter momentary mushroom pushbutton	30/PF...		30/PFL...	
60 diameter momentary mushroom pushbutton	30/PF...-60		30/PFL...-60	
40 diameter rotary release mushroom pushbutton	30/PFB...-40		30/PRLGM...	
60 diameter rotary release mushroom pushbutton	30/PFB...-60		30/S...	

30mm diameter operators – Dimensions (mm)

Non-illuminated and illuminated operators

Series	Model	Opaque metal operators	Model	Illuminated metal operators
Key release mushroom pushbutton	30/PFBC...		SE14G...	

Two and four position operators

Series	Model		
Joystick and Contact element	TM2I-... TM2S-... TM4S-... TM4I-...		



30mm diameter operator accessories – Dimensions (mm)

Series and model	Dimensions
E1 Plate holder	
C01B C10B Contact elements	
C02 C20 C11 Contact elements	
BL9S-B BR24-B BR110-B BR220-B Lamp holder	
BT BR BLL Complete lamp holder	
BTC BRC BLLC Complete lamp holder	

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