

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.

22mm diameter non-illuminated operators – Thermoplastic - Rear ring-nut mounting



Flush pushbutton

| Code | Model | Description |
|----------|-------------|-----------------|
| ER502010 | IPR1 | Black operator |
| ER502020 | IPR2 | Red operator |
| ER503030 | IPR3 | Green operator |
| ER502040 | IPR4 | Yellow operator |



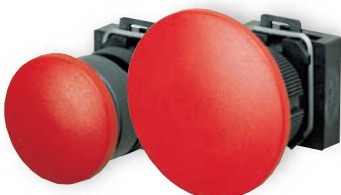
Extended pushbutton

| Code | Model | Description |
|----------|-------------|-----------------|
| ER502090 | IPS1 | Black operator |
| ER502100 | IPS2 | Red operator |
| ER502110 | IPS3 | Green operator |
| ER502120 | IPS4 | Yellow operator |



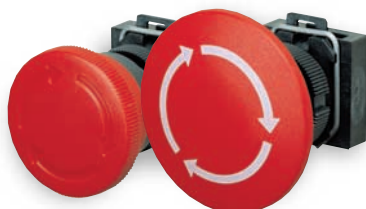
35mm diameter push-pull mushroom pushbutton

| Code | Model | Description |
|----------|----------------|---------------------------|
| ER502360 | IPFBPT1 | 35 mm dia. black operator |
| ER502350 | IPFBPT2 | 35 mm dia. red operator |



Momentary mushroom pushbutton

| Code | Model | Description |
|----------|----------------|----------------------------|
| ER502150 | IPF2 | 35 mm dia. red operator |
| ER502190 | IPF4 | 35 mm dia. yellow operator |
| ER502200 | IPF2-60 | 60 mm dia. red operator |
| ER502220 | IPF4-60 | 60 mm dia. yellow operator |



Turn to release mushroom pushbutton

| Code | Model | Description |
|----------|-----------------|----------------------------|
| ER502420 | IPFB2-30 | 30 mm dia. red operator |
| ER502440 | IPFB4-30 | 30 mm dia. yellow operator |
| ER502320 | IPFB2-40 | 40 mm dia. red operator |
| ER502370 | IPFB4-40 | 40 mm dia. yellow operator |
| ER502300 | IPFB2-60 | 60 mm dia. red operator |



Turn to release mushroom pushbutton with safety snap locking

| Code | Model | Description |
|----------|------------------|---|
| ER502330 | IPFB-II-2 | 40 mm dia. red operator (Δ) |
| ER502430 | IPFB-IN-2 | 40 mm dia. red operator with red or green status indication (▲) |

Δ - In accordance with EN 418

▲ - In accordance with EN 418 - EN 81

35mm diameter mushroom button with key release

| Code | Model | Description |
|----------|---------------|----------------|
| ER502390 | IPFBC1 | Black operator |
| ER502400 | IPFBC2 | 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 C27.

- Dimensions page **C23**
- Technical information page **C8**

22mm diameter operators – Dimensions (mm)

Non-illuminated operators

| Series | Model | Thermoplastic and metal operators | Model | Metal operators (screw connections) |
|--|---------------------------------------|-----------------------------------|-------------|-------------------------------------|
| Flush pushbutton | IPR... PR... QPR... | | PR.../V | |
| Extended pushbutton | IPS... PS... QPS... | | PS.../V | |
| Push-pull mushroom pushbutton | IPFBPT... PFBPT... | | PFBPT.../V | |
| 35 diameter axial mushroom pushbutton | IPF... PF... QPF... | | PF.../V | |
| 60 diameter axial mushroom pushbutton | IPF...-60 PF...-60 QPF...-60 | | PF...-60/V | |
| 40 diameter rotary release mushroom pushbutton | IPFB...-40 PFB...-40 QPFB...-40 | | PFB...-40/V | |
| 60 diameter rotary release mushroom pushbutton | IPFB...-60 PFB...-60 QPFB...-60 | | PFB...-60/V | |
| 35mm diameter mushroom button with key release | IPFBC... PFBC... QPFBC... | | PFBC.../V | |

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22mm diameter operators – Dimensions (mm)

Non-illuminated operators

| Series | Model | Thermoplastic operators | Model | Metal operators |
|--|-------------------------------------|-------------------------|-------|-----------------|
| Turn to release mushroom button with safety snap locking | IPFB-II-2 PFB-II-2 PFB-II-2/V | | | |
| Turn to release mushroom button with safety snap locking | IPFB-IN-2 PFB-IN-2 PFB-IN-2/V | | | |

Illuminated operators

| Series | Model | Thermoplastic and metal operators (ring-nut mounting) | Model | Metal operators (screw mounting) |
|---|------------------------------|---|-------------|----------------------------------|
| Flush pushbutton | IPRL... PRL... QPRL... | | PRL.../V | |
| Extended pushbutton | IPSL... PSL... QPSL... | | PSL.../V | |
| Push-pull mushroom pushbutton | IPFLBPT... PFLBPT... | | PFLBPT.../V | |
| 35 diameter momentary mushroom pushbutton | IPFL... PFL... | | PFL.../V | |
| Light signal | IS... S... QS... | | S2/V | |
| Complete light signal | BA9N... BA9NR... | | | |

Contact elements for 22 or 30mm diameter operators



Contact elements (*)

| Code | Model | Description | |
|----------|-------------|-------------|--|
| ER520810 | C01B | 1 NC | |
| ER520800 | C10B | 1 NO | |



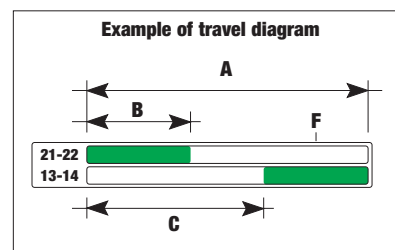
| Code | Model | Description | |
|----------|------------|-------------|--|
| ER520840 | C02 | 2 NC | |
| ER520830 | C20 | 2 NO | |
| ER520820 | C11 | 1 NC + 1 NO | |

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 **C32**
- Technical information page **C8**

Accessories for 22mm diameter operator - Dimension (mm)

| Series and model | Dimensions | Series and model | Dimensions |
|---|------------|---|------------|
| PTR PTQ Plate holders | | DG22 DGS22 Adhesive yellow disc | |
| EN Series adhesive labels | | T22 Closure caps for 22.5 hole | |
| P22-2 P22-3 P22-4 Anti-dust caps for double pushbutton | | R01 R10 Contact elements for control station | |
| P22 Dust caps for flush pushbuttons | | BL9R GRR Lamp holder for rear mounting | |
| P22-A Dust caps for extended pushbuttons | | C01B C10B Contact elements | |
| CF Dust caps for for contacts elements | | C02 C20 C11 Contact elements | |
| AR Reset button rod | | Adhesive legend labels | |