



Main data

- Adjustable intervention point
- Output signals without bounces
- Two static outputs 1NO and 1NC
- Reduced actuating force
- Power supply and switching LED
- Minimum differential travel

Markings:



Approval GOST: POCC IT.AB24.B04512

In conformity with requirements requested by:

Low Voltage Directive 2006/95/EC,
Machinery Directive 2006/42/EC and
Electromagnetic Compatibility 2004/108/EC.

Technical data

The article E1 is an electronic contact block, designed to replace the traditional mechanical contact block placed inside the position switches of Pizzato Elettrica. The combination between the body and the head of a position switch with this electronic contact block makes a mechatronic device that increases the application range of position switches.

General data

Ambient temperature:	from -25°C to +80°C
Max actuation frequency:	3600 operations cycles ¹ /hour
Mechanical endurance:	20 million operations cycles ¹
Adjustable intervention distance:	from 0,2 to 2 mm or from 2° to 30°
Differential travel:	< 0,1 mm or < 1°
Driving torque for installation:	see pages 7/1-7/12
<small>(1) One operation cycle means two movements, one to close and one to open contacts, as foreseen by EN 60947-5-1 standard.</small>	

Electrical data

Rated operation voltage (Ue):	from 10 to 30 Vdc
Rated operation current (Ie):	200 mA
Utilization category:	DC13
Rated insulation voltage (Ui):	30 V
Pollution degree:	3
Conditional short circuit current:	100 A
Voltage drop (Ud):	2 V
Min. operation current (Im):	0 mA
Current in lock state (Ir):	0,05 mA
Max residual ripple:	10%
Absorbed current with no load (Io):	< 10 mA
Protection against the short circuit of the load:	yes
Protection against polarity inversions:	yes
Output type:	PNP
Power supply LED:	yes
Switching LED:	yes
Protection fuse:	315 mA fast type

Cross section of the conductors (flexible copper wire)

Contact block E1:	min. 1 x 0,5 mm ²	(1 x AWG 20)
	max. 1 x 2,5 mm ²	(1 x AWG 14)

In conformity with standards:

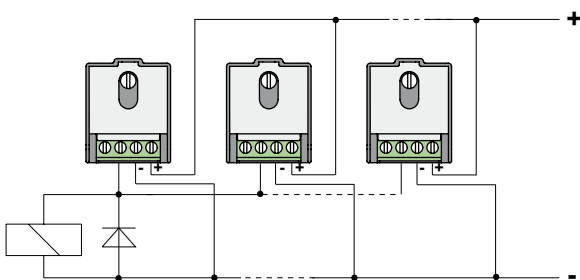
IEC 60947-5-1, EN 60947-5-1, IEC 60529, EN 60529, EN 61000-6-2, EN 61000-6-3

- Not suitable to be used for safety application.

-To be used only with FD, FP, FL, FR, FM, FX and FZ series.

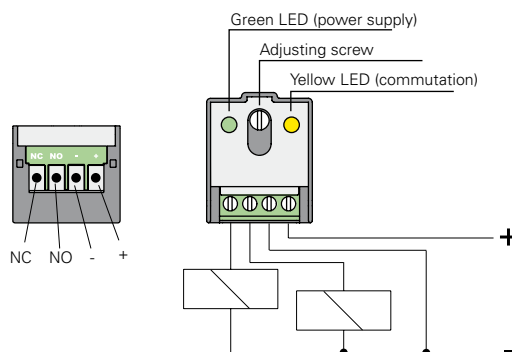
Parallel connection of several units E1 (OR)

The connection of many electronic contact blocks (OR) in parallel does not require any special precaution. With inductive loads (relay) it is advisable to install a protection diode.



Connection diagrams

The wiring connection comes through a marked terminal block indicating the function of each pole. There are two signal LEDs: the first one shows power supply presence and the second shows the commutation.



Technical features

The contact block E1 consists in a photoelectric sensor that checks the position of the mechanic actuator, with the following features:

- 1) Feasibility of adjusting the switching point by a screw directly applied on the contact block. The adjusting screw is positioned on the cap of the contact block, in order to offer an easy setting point, without extracting the contact block from the switch body.
- 2) Differential travel below 0,1 mm, guaranteed for whole range of working temperature.
- 3) Reduced actuating force.
- 4) Two static PNP output, 1NO+1NC, protected against short circuit.
- 5) Exit signal without bounce.
- 6) Wide range of working temperature.
- 7) Signal LEDs for power supply and switching.

The above performances allow to resolve the following problems:

- 1) When interfacing the switches with PLC there are problems because of contacts bouncing or in case of very low voltages.
- 2) When it is necessary to sense light objects which require a contact block with high sensibility and reduced actuating forces.
- 3) When it is necessary to sense very small objects which require a very low differential travel.
- 4) When it is requested to adjust the switching point. The internal LED shows the switching point when you turn the adjusting screw.
- 5) In cases where the perfectly simultaneous commutation of the two outputs is required.
- 6) When it is necessary to detect transparent objects, or where the use of normal sensors is not feasible, keeping in mind that special sensors normally have a higher price than this solution.



Installation advises

The E1 contact block is protected against electric interference of industrial environment. When used under extreme conditions, as for example installed close to high overloads (electric motors, welding machines, etc.), it is advisable to adopt the following precautions:

- Exclude or limit the interference from the source.
- Filter the power supply with adequate capacity
- Separate the power wires from the unit wires.
- Limit the cable length to max 200 m.

Check the drop of tension along the power supply wires. When necessary, twist and shield the output wires of the units or use a suitable twisted and shielded wire with a suitable section.

Series connection of several units E1 (AND)

To connect the units in series (AND), it is necessary to comply with the following conditions:

The electric current of the first unit is the addition of the electric load and the max. load absorbed by the other units: if we consider the connection of n units, the nominal current " I_e " results:

$$I_e = (200 - 20 \times n) \text{ mA}$$

Where I_e : rated operation current
 n : number of units connected in series

Example: with 3 units you can switch maximum 140 mA.

When working, each unit causes a drop of tension. The load should be suitable to work with a tension of:

$$U_c = U_a - 2 \times n$$

Where U_c : rated operation voltage
 U_a : tension on the load
 n : number of switches connected in series

Example: with 3 units powered at 24 Vdc, the load should work at 18 Vdc.

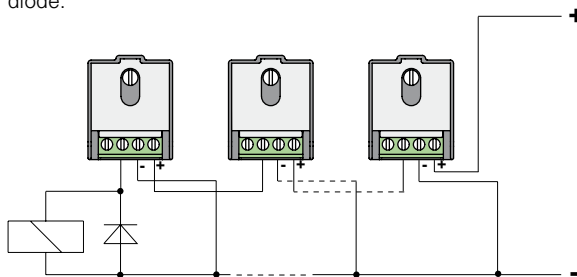
The maximum number of units that can be connected in series depends on the supply voltage. In any case, the number should be lower to:

$$n_{\max} \leq \frac{V_a - 10}{2} + 1$$

Where n_{\max} : max. number of units connected in series
 V_a : supply voltage

Example: with 24 Vdc it is possible to connect a maximum of 7 units. With 30 Vdc it is possible to connect 11 units.

With inductive loads (relay) it is advisable to install a protection diode.



Particular loads

The unit is protected against overload and short-circuit, so it is necessary to limit the inrush current of the electric load. Typical examples are capacitors, which require a high current impulse during their load, and incandescence lamps, the electric resistance of which is the tenth part of the hot electric resistance. For the capacitive loads, when necessary, connect a limit resistance in series, whereas for the lamps, when necessary, use a suitable electric resistance of pre-heating.