

# Operating Instructions

## Switching Units ESA25 / ESP25

**BIRCHER REGLOMAT**

### General

With the following described switching units in conjunction with Bircher tactile safety sensors, safety systems, according to the relevant standards GS-BE-17, ZH1/494 and EKAS 1511, can be achieved. Switching and safety systems using ESA/ESP 25 switching units are used in edge, surface and collision protection applications. The appropriate safety edges (ESLE), safety mats (ESM) and safety bumpers (ESB) are available. Typical areas of use are door and gate monitoring.

### Status LED

Supply	Function	Green	Yellow	Red	Output
Off		☐	☐	☐	Open
On	Ready	☀	☐	☐	Closed
On	Sensor activated	☀	☀	☐	Open
On	Short-circuit or test	☀	☀	☐	Open
On	Cable breakage	☀	☐	☀	Open

### Function

#### General

When the sensors are connected, changes in the no-load current will be monitored. In this non-active condition, both output relays are energized.

If one or more sensors are activated, the total resistance drops towards zero Ohm. When the resistance falls below a defined limit, the signal output relays will de-energize and the yellow LEDs illuminate.

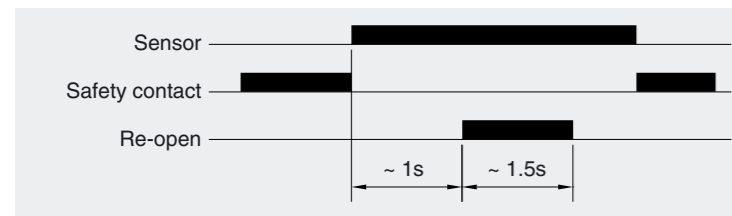
If the resistance exceeds a certain upper level, (e.g. interruption in the signal circuit) this will be recognised as a fault. The relays de-energize and the red LEDs illuminate.

#### ESA 25, ESP 25, ESZ 25

When a signal transmitter is activated both relays will instantly de-energize. If the signal transmitter is not activated, both relays are energized.

#### ESAS 25, ESPS 25, ESZS 25 / Stop – Re-open

Basic function as ESA 25/ESP 25. Additionally, after activation of the signal transmitter for approx. 1 second, the third relay contact will close for approx 1.5 seconds. This impulse (1.5 sec.) initiates a re-opening after the closing operation has been halted, e.g. to activate a second drive motor. This function is only active when contact 8-7A is closed.



#### ESAT 25 / ESPT 25 / Service Door

Basic function as ESAS 25/ESPS 25. Additional input for service door output with emergency stop circuit.

### Connection of Sensors

Sensors, with a total length of up to 25 m or a total area of 5 m<sup>2</sup>, can be connected. The sensors are to be connected in series and the last element must have a termination resistor to monitor the no-load current.

### Wiring Suggestions

Important: It is imperative to use the indicated fuses. They protect the relay contacts from melting due to overload. Suppressors 2200 hm/0,1 uF are to be connected across inductive loads (not the contacts).

### Commissioning

- It is recommended that before connecting the signal sensor the resistance should be measured. In an inactive condition it should be between 7.5 and 9.0 kOhm (normal 8.2 kOhm).
- Check wiring. Is F1 fitted with max. 2 A slow?
- Check the supply voltage information on the type plate of the switching unit.
- After switching on the unit, the green LED illuminates which indicates operating readiness of the system.
- When the sensor is actuated both yellow LEDs illuminate and the output relays de-energize.
- If a terminal is disconnected (e.g. 2) both red LEDs illuminate and the output relays de-energize.
- The switching unit and sensors are to be installed and wired according to the applicable local regulations. The min. sensor cable cross section is 0.5 mm<sup>2</sup>. The

Switching Unit in Mounting Housing (ESA) can be screwed directly to mounting service by means of holes in the housing. It maintains protection class IP65. The print versions ESP can be fixed to the mounting surface with M3 screws through distance bushes using the fixing holes in the print. It should be noted that the print is neither protected against accidental touch or dampness (IP00).

h) The plugable (ESZ) versions are equipped with a PHOENIX MSTBA 2.5/10-G-5.08 plug and can be connected by using the mating socket contacts PHOENIX (e.g. KV 2.5/10-G-5.08). The P.C.B. is not protected from either accidental contact or moisture.

Please note: The pin assignments for ESZ 25 and ESZS are not identical.

### Periodic Tests

#### General

The correct function of the 2-channel safety system is to be periodically checked (e.g. monthly or according to applicable national regulations).

#### ESA/ESP

In order to check each single redundant channel the contacts J1 and J2 must be bridged following each other. Each time the drive circuit must switch off. The yellow LEDs indicate which channel was activated. The test «Interrupt» is achieved by loosening the sensor. In this case the drive circuit must also switch off. Both red LEDs illuminate.

It is suggested that the checks should be documented.

#### ESAS/ESPS

The test «Stop - Re-open» is achieved by bridging the contact J2. After activating this contact for approx. 1 second the third relay must energize and after a further 1.5 seconds, de-energize.

#### ESAT/ESPT

The test «Stop - Re-open» identical to ESAS/ESPS. For «Service Door» test, short-circuit terminals 9/10. The relay contact 11/12 must close. When the short-circuit on terminals 9/10 is removed, the contact 11/12 must re-open.

### Technical Data

	ESA 25	ESA 25P	ESZ 25
Housing	ABS grey	–	–
	transparent cover	–	–
– Dimensions	80 x 110 x 65	70 x 94	76 x 94
– Protection Class	IP65	IP00	IP00
– Cable gland	3 x PG7	–	–
Supply Voltage			
– 230VAC	(+10/-20%) with isolating transformer	–	–
– 115VAC	(+10/-20%) with isolating transformer	–	–
– 24VADC	24 VAC/24 VDC (+10/- 10%)	–	–
– Frequency Range	50/60Hz	–	–
Power Consumption	max. 4VA	–	–
Sensor Inputs			
– Input resistance	5 kOhm to 12 V (internally)	–	–
– Input voltage with 8.2kOhm	approx. 7.5 VDC	–	–
Signal Output Relay			
– Switching Capacity	2A/250 VAC	–	–
– Reaction time (energize)	< 30 ms	–	–
– Reaction time (de-energize)	< 20 ms	–	–
Indicators	LED 3 mm	–	–
– Operation	Green	–	–
– Safety Shutdown	Yellow (2 off)	–	–
– Fault Red (2 off)	–	–	–
Temperature Range	–20°C to 55°C	–	–
Testing Basis	GS-BE 17 and ZH 1/494 / EKAS 1511	–	–

#### Supplementary data

	ESAS 25	ESPS 25	ESZS 25
Function «Re-open»	ESAS 25	–	–
House	look ESA	–	–
– Cable gland	3 x PG 7, 1 x PG 9	–	–
Relay for Re-open function			
– Switching Capacity	2A/250VAC	–	–
– Time Delay	1...1.5 sec	–	–
– Impulse Duration	1,5...2 sec	–	–
Function «Service Door»	ESAT 25	ESPT 25	–
House	ESAT	ESPT	–
– Dimensions	105 x 105 x 66	94 x 94 x 32	–
– Protection Class	IP 55	IP 00	–
– Cable Gland	4 x PG 7, 1 x PG 9	–	–
Relay for Service Door			
– Switching Capacity	2 A/250 VAC	–	–

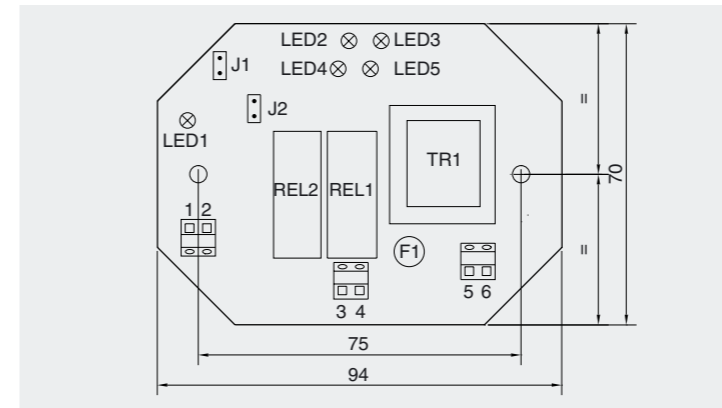
### Connections, Component Layout

#### General

LED1	Operating indicator (green)
LED2, LED4	Function indicator (yellow)
LED3, LED5	Fault indicator (red)
REL1, REL2	Switching relays, working contacts switched in series
F1	Fuse 2A slow, relay contact protection
J1	Test contact for REL1
J2	Test contact for REL2

REL 3	Switching relay working contact
J2	Test contact for REL 2 and REL 3

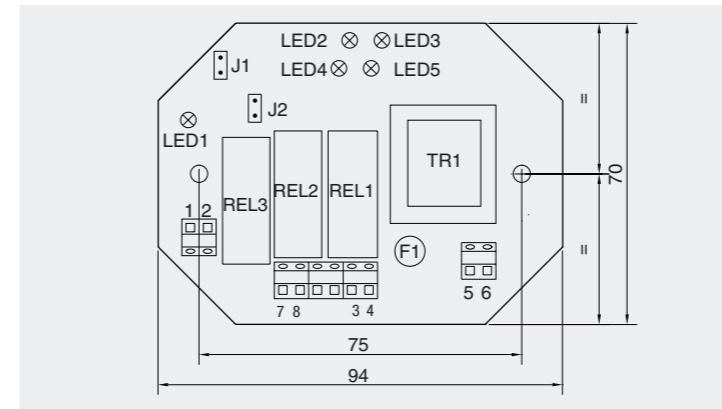
### ESA 25, ESP 25



#### Wiring diagram:

3, 4 Safety circuit 5, 6 Supply 1, 2 Sensor

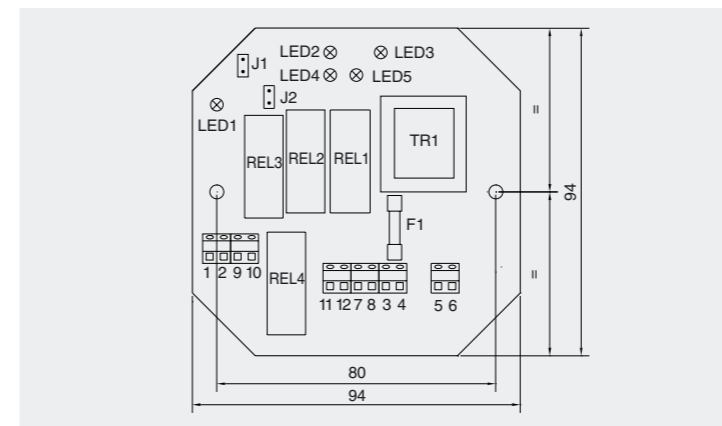
### ESAS/ESPS



#### Wiring diagram:

3, 4 Sensor circuit 7, 8 Stop - Re-open 5, 6 Supply 1, 2 Sensor

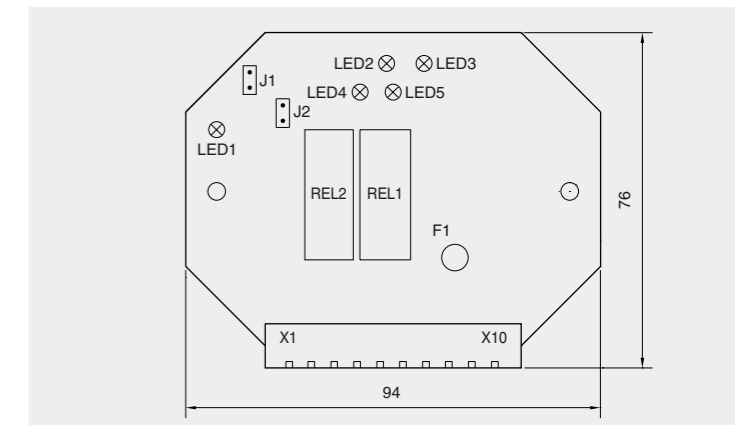
### ESAT/ESPT



#### Wiring diagram:

3, 4 Safety circuit 7, 8 Stop - Re-open 5, 6 Supply 1, 2 Sensor 9, 10 Input service-door 11, 12 Output service-door

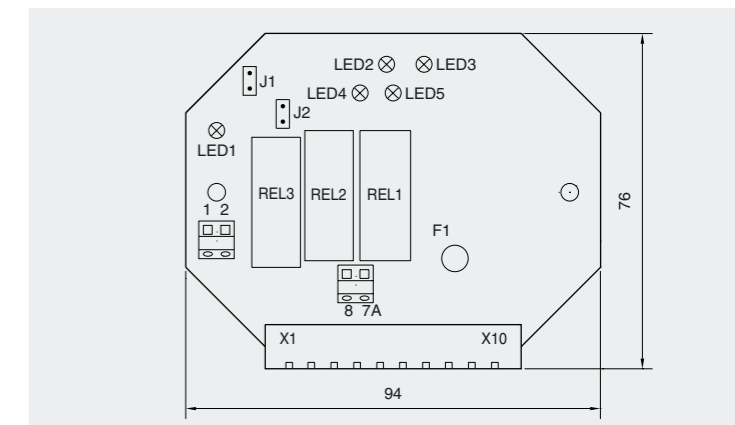
### ESZ 25



#### Plug: Pin assignment

X1, X2 Signal transmitter (IN; GND) X4, X5 Output; Safety X7, X9 Power supply 24VAC X3, X6, X8 Not assigned X10 GND not contacting

### ESZS 25



#### Plug: Pin assignment

X1, X2 Output restart X4, X5 Output safety X7, X9 Power supply 24VAC X3, X6, X8 Not assigned X10 GND not contacting 1, 2 Signal transmitter 8, 7A Disconnect restart

### Warranty and liability

- The warranty and liability of Bircher Reglomat AG are based on the sales contract.
- The warranty and liability shall expire prematurely, should the client or third parties not use and/or operate the product in compliance with existing operating instructions, should incorrect changes or repairs be made by the client or third parties, should the client or third parties, when a fault has occurred, not take suitable steps at once for a reduction of possible damage/losses and offer Bircher Reglomat AG a chance for remedying the said fault.
- The warranty and liability shall exclude any damage for which there is no proof that it is due to poor materials, faulty construction, poor workmanship, and any damage caused by other reasons, for which Bircher Reglomat AG cannot be held liable.
- No liability can be assumed for any consequential damage, provided this is not governed otherwise by applicable product liability laws and regulations.
- Warranty claims made against the seller on the basis of the sales agreement are not affected by these regulations.
- For the benefit of its customers Bircher Reglomat AG constantly develops its products further. Bircher Reglomat AG reserves the right to make changes to any of the products described in this document without prior notice.