



# Capacitor Release Unit KA 4

## Application

The use of the capacitor release unit KA4 is appropriate, especially in the cases, if it is difficult to deliver the necessary energy for tripping the circuit breaker, such as in stations without batteries.

It supports an auto reclosing function of the protection device also.

Furthermore it can deliver energy and drives the coil for the required tripping of a circuit breaker at auxiliary voltage blackout.

When the auxiliary voltage for a protection device e.g. series D...2, DSZ4 ( $U_x=110...320$  V DC) is not reliable enough, the protection device can be supplied for some seconds to ensure tripping. The large capacity of the KA4 makes it possible.

The short charging time of PI-No. 1737010000, ...200 and ...400 allows use in cases in which intermittent power system faults can discharge the KA4.

The model (PI-No. 1737010300) was made for connection to voltage instrument transformers. Its peak loading current is limited to about 0.05 A, on the other hand it needs a longer time for loading.

The used capacitors ensure that tripping energy can be available sufficiently also after more than 24 hours.

The capacitor release unit has two same sized capacitor batteries.

That at the terminal 3 available capacity is decoupled by diodes from the other capacitors.

Discharging of capacity at terminal 2 does not affect the charge of terminal 3 – capacity.

In the other case, one discharges over terminal 3 also the capacitor-battery at terminal 2.

If the energy-quantity is not enough, several KA4's can be connected in parallel

over the diode decoupled terminal 4.

A KA4 model (PI-No. 1737010100) possesses the possibility of voltage doubling for the input voltage of 100/110 V a.c.

The models PI-No. 1737010200, ...300 and ...400 are intended for driving (60)..110V d.c. coils, the other models are used for (110)...220 V d.c. tripping coils.

For signalling of missing input a.c. auxiliary voltage a potential-free NC-contact (11-12) is available.

## Special features are

- long lifetime (25°C/ approx. 30J)
- Energy storing over more than a day,
- Large capacity and amount of stored energy,
- Short charging time in PI-No. 1737010000, 1737010200 and 1737010400,
- Reduced stockpiling because of internal input voltage jumper settings 230 V  $\leftrightarrow$  100/110 V in variants PI-No. 1737010000 and 1737010100,
- low influence of the instrument voltage transformer by model PI-No. 1737010300
- increased capacity in variant PI-No. 1737010400 delivers more stored energy compared with PI.No. 1737010200
- Overload protection,
- An alarm contact for signalling of missing input voltage or overload (overload not with PI-Nr. 1737010300),
- A discharge key for both discharging of capacitors and capacity checking,
- The green LED signals an input voltage and
- The red LED shows discharging of capacity if discharge key is pressed.

## Function

Electrolytic capacitors are charged through the rectifying circuit without galvanic separation. The input voltage is signalled by the green LED. The output voltage is not stabilised.

At failure or low input voltage a relay separates the capacitor circuit from input and signals it.

The charge energy is available at separate screw terminals 1–2 (half capacity) and full capacity at 1–3 or 1–4.

A capacitors test is possible using the discharge key and watching red LED.

The resistance of the tripping coil should not fall below 25  $\Omega$  at PI-Nos. 1737010200, ...300, ...400 and 50  $\Omega$  at 230 V – output model.

A permanent overload at the output terminals leads to a high resistance PTC or current limiting by a resistor if input voltage exists.

The variants PI-No. 1737010000 and PI-No. 1737010100 having an output voltage of about 300 V can be reprogrammed into each other by changing of jumpers (input voltage 230 V or 100/110 V a.c. using voltage doubler).



### Specifications

- plastic casing for panel mounting fastening 35 mm mounting rail or 2 screws M4
- weight approx. 1 kg
- degree of protection casing IP 40 terminals IP 20
- connecting area 1 x 0.5 ... 2.5 mm<sup>2</sup>

### Permissible ambient conditions

- operating temperature -10°C...+55°C
- storage temperature -25°C...+55°C
- transport temperature -25°C...+70°C
- rel. humidity annual mean 75% for 30 days 95% at <40°C moisture condensation not permitted

### Mechanical strength

- resistance to earthquakes IEC 60255-21-3 nominal frequency range 1...35 Hz cut-off frequency 8...9 Hz horizontal 3.5 mm; 10 m/s<sup>2</sup> vertical 1.5 mm; 5 m/s<sup>2</sup>
- vibration strain IEC 60255-21-1 Fc: 10...150 Hz; 0.075 mm; 1 g
- repeated impact strain IEC 60255-21-2

Ea: 11 ms; 15 g, Eb: 16 ms; 10 g

### Input

- nominal input voltage  $U_n$  depending on model a) 230 V AC (DC) b) (voltage doubler) 100/110 V AC c), d), e) 100/110 V AC (DC)
- upper tolerance of  $U_n$  (at higher output voltage) a), b), d), e) +15 % c) +30 %
- charging current rush a), b), c), e)  $\approx 10$  A d) < 0.05 A
- power consumption in continuous duty at  $U_n$  approx. 2 VA; d): 1 VA
- charging time, depending on model a) approx. 800 ms b) approx. 90 ms c) approx. 500 ms d) approx. 10 min e) approx. 5 s

### Output

- output voltage depending on model (at  $U_n$ ) a) approx. 320 V DC b) approx. 260/310 V DC c), d), e) approx. 135/148 V DC

- capacity, terminals 2-1 a)..c) 1120  $\mu$ F d), e) 3600  $\mu$ F terminals 3-1 a)..c) 2240  $\mu$ F d), e) 7200  $\mu$ F
- amount of energy at  $U_n$ , depending on model (terminals 3-1) a) 103 J b) 78/97 J c) 19/22 J d), e) 59/71 J
- self-discharging time to 0.5-U > 48 h
- max. permanent output current a), c), e) 0.1 A b), d) 0 A
- output proof against overload and shorts
- input/output potential separation no

### Output relay

- relay 1 normally closed (NC) switching voltage 250 V DC, AC switching capacity (voltage- and load dependent) <150 W DC, <2000 VA AC limiting continuous current 5 A

### Lifetime (informative)

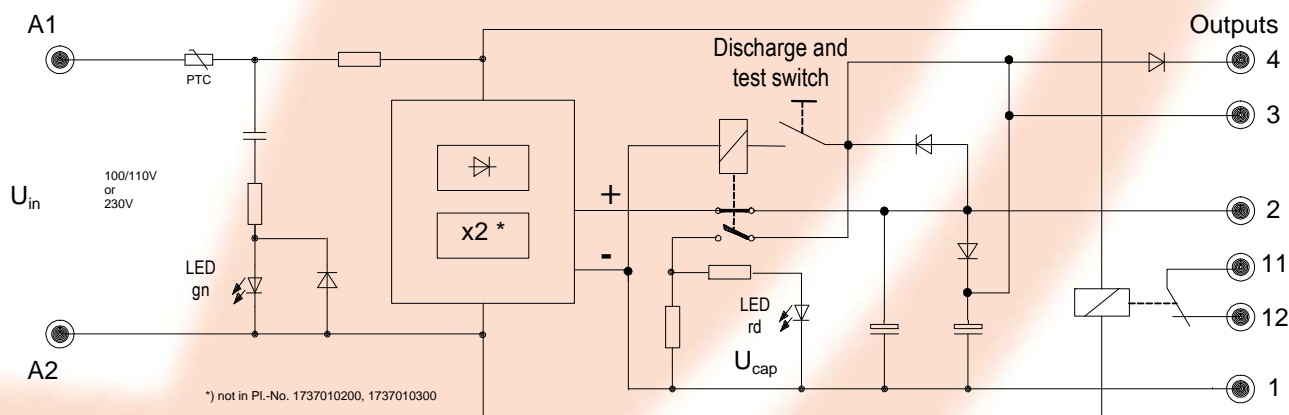
- Lifetime (25°C) approx. 30 years

### Order data

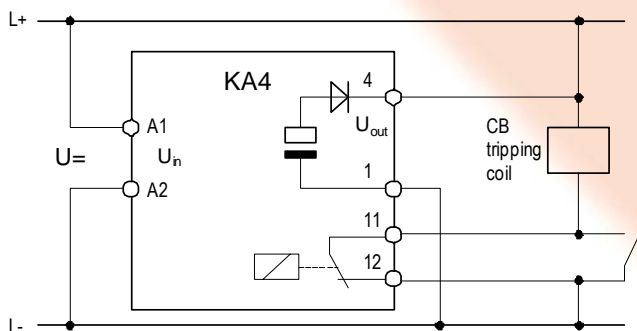
Pl.-No. 1737 010 x00

Model	
a) 230V $U_{in}$ / 300V $U_{out}$ , 2240 $\mu$ F	0
b) 100/110V $U_{in}$ / 300V $U_{out}$ , 2240 $\mu$ F	1
c) 100/110V $U_{in}$ / 130V $U_{out}$ , 2240 $\mu$ F	2
d) 100/110V $U_{in}$ , 50mA $I_e$ / 130V $U_{out}$ , 7200 $\mu$ F	3
e) 100/110V $U_{in}$ / 130V $U_{out}$ , 7200 $\mu$ F	4

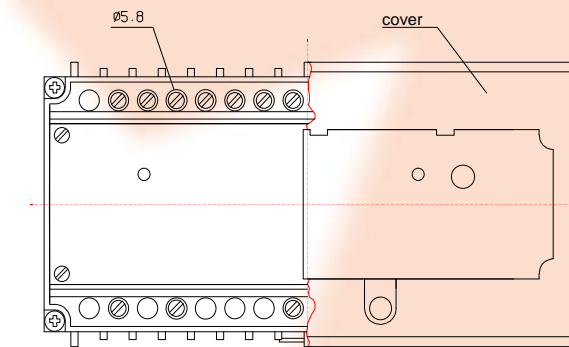
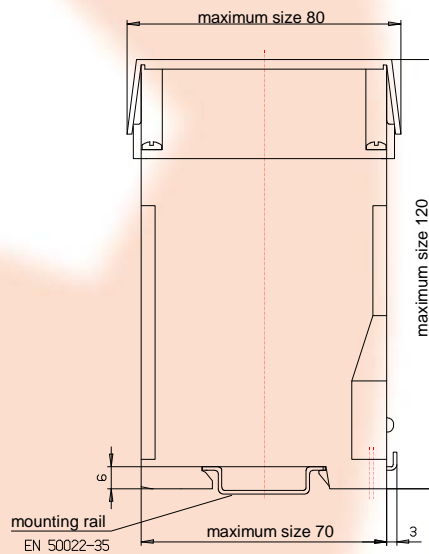
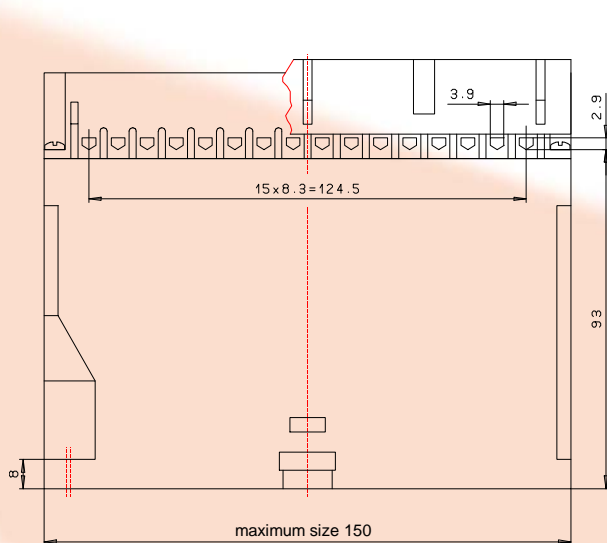
with  $U_{in}$  input a.c. voltage  
 $I_e$  input current  
 $U_{out}$  output d.c. voltage



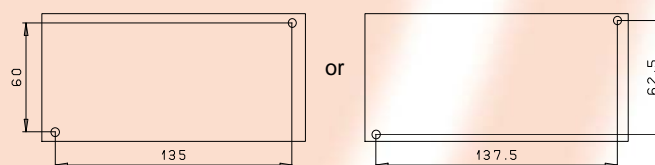
Principle schematic and terminal assignment



Basic circuit diagram for C.B. tripping at missing auxiliary voltage



Drilling pattern for screw M4



Dimension drawing KA 4

**Inquiries:**

Sprecher Automation  
Deutschland GmbH  
Moellendorffstr. 47  
10367 Berlin  
Germany

Sprecher Automation GmbH  
Franckstrasse 51  
4018 Linz  
Austria

Sprecher Automation GmbH  
Ignaz-Köck-Straße 10  
1210 Wien  
Austria

Sprecher Automation  
Polska Sp z o.o.  
ul. Łączna 4  
58-100 Świdnica  
Poland

Sprecher Automation  
spol. s r.o.  
Kopčianska 14  
851-01 Bratislava  
Slovakia

Tel: +49 30 6449241-70

Tel: +43 732 6908-0

Tel: +43 732 6908-601

Tel: +48 74 85135-31

Tel: +421 2 682055-00

Fax: +49 30 6449241-99

Fax: +43 732 6908-321

Fax: +43 732 6908-5601

Fax: +48 74 85135-32

Fax: +421 2 682055-10

Email: [info@sprecher-automation.com](mailto:info@sprecher-automation.com)

Internet: [www.sprecher-automation.de](http://www.sprecher-automation.de), [www.sprecher-automation.at](http://www.sprecher-automation.at), [www.sprecher-automation.com](http://www.sprecher-automation.com), [www.sprecher-automation.pl](http://www.sprecher-automation.pl), [www.sprecher-automation.sk](http://www.sprecher-automation.sk)

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