

CONTENT

TRIP CIRCUIT SUPERVISION RELAY KIT-11A

inside of the module HX1, system Combiflex

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The producer reserves the right to modify data and design in the light of future progress.

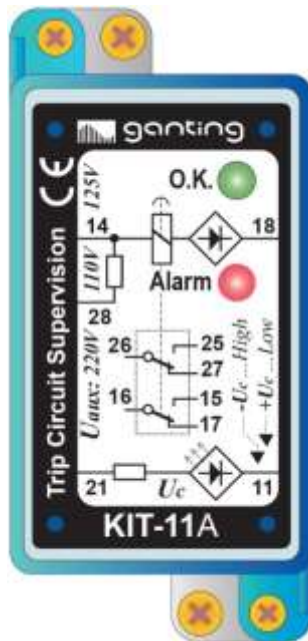


APPLICATION, FEATURES AND PROPERTIES

APPLICATION

KIT-11A is intended for continuous supervision of the circuit breaker's trip coil loop. This monitoring includes:

- loss of auxiliary voltage;
- interruption of the electromagnet's trip coil;
- interruption or bad contact in installation;
- the error in relay **KIT-11A** itself;
- regardless of the cause of fault event the logic of **KIT-11A** counts down the Alarm Time.













FEATURES and PROPERTIES

- Easy setting for pick-up / drop-out level of the input polarity U_c (+/-):
+ U_c to 11, - U_c to 21 ... On > 40V, Off < 25V,
+ U_c to 21, - U_c to 11 ... On > 80V, Off < 70V; *See Photos 2, 3.
- The alarm is delayed for 3.5 s, after U_c or U_{aux} disappears;
- Compact design in the new Combiflex system, size Hx1.
- Gold-plated solid connection pins prevent corrosion inside the Hx1 module;
- Line monitoring Current is below 2mA;
- Wide range of active (O.K.) Control Voltage $U_c = (60 \text{ to } 264)V$;
- The same module for nominal Auxiliary Voltage 110V, 125V or for 220V:
 - for nominal power supply 110V and 125V the connection is via pins (14,18) and
 - for nominal power supply 220V the connection is via pins (28,18).

DESCRIPTION of OPERATION

The trip circuit supervision relay **KIT-11A** contains two galvanically separated circuits: the supervision-measuring circuit and the supply circuit.

State indication		Description of state indication	State of relay	Events	Reasons
O.K. Fault	 	The green LED lits, indicating the O.K. state.	The output relay is ON.	The relay is operating properly.	Supervision is O.K..
O.K. Fault	 	The red LED indicates a fault state.	The tolerance delay time run out. The output relay switched off. The alarm is provided by a normally closed contact.	1. Interruption of current in the control circuit (pin 11 - 21);	1.1. Disappearance of voltage across terminals (11 - 21). $U_c = 0$; 1.2. The trip contact of protection is permanently closed; 1.3. Interruption of instalation from $+ U_{bat}$ to $- U_{bat}$; 1.4. Interrupted wires in the control circuit connection between the terminals (11 - 21); 1.5. Interrupted trip coil; 1.6. Interruption in line or line resistor $R_p=22k/5W$.
O.K. Fault	   →  Transition in 10s.	The red LED lights up for about 10 seconds, than disappears.	The red light is provided from capacitor storage for about 10s. Loss of auxiliary voltage will be alarmed after the time delay count out.	2.1. Interruption of auxiliary supply - terminals (18 -28);	
O.K. Fault	 	Both LEDs are OFF.	The relay is OFF.	No power supply. ($U_{aux} = 0, U_c = 0$)	3.1. that the auxiliary voltage for KIT-11A disappeared more than 30 seconds ago; 3.2. Inside the terminals (18 - 28) there is an error lasting more than 30 seconds.

*SELECTION
of Low/High treshold of Control voltage level*

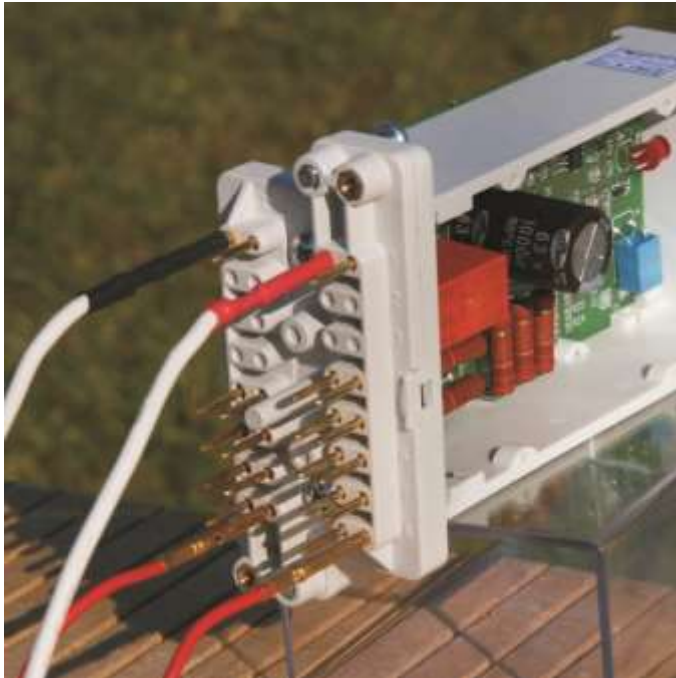


Photo 2:

Connection for **low level switching of input U_c** :

- pin 11 is connected to the plus terminal of the source U_c and
- pin 21 to the minus of U_c ;

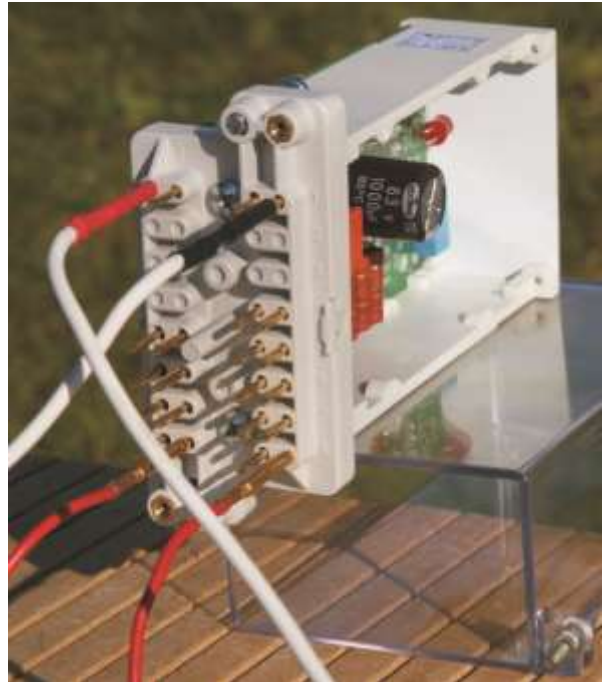


Photo 3:

Connection for **high level U_c input:**

- pin 11 is connected to $-U_c$ and
- pin 21 to $+U_c$;

DIAGRAM OF OPERATION

The expected input voltage U_c is usually a digital function. If an incomplete transition of the control function occurs, the alarm time may be delayed and depends on the voltage U_c drop.

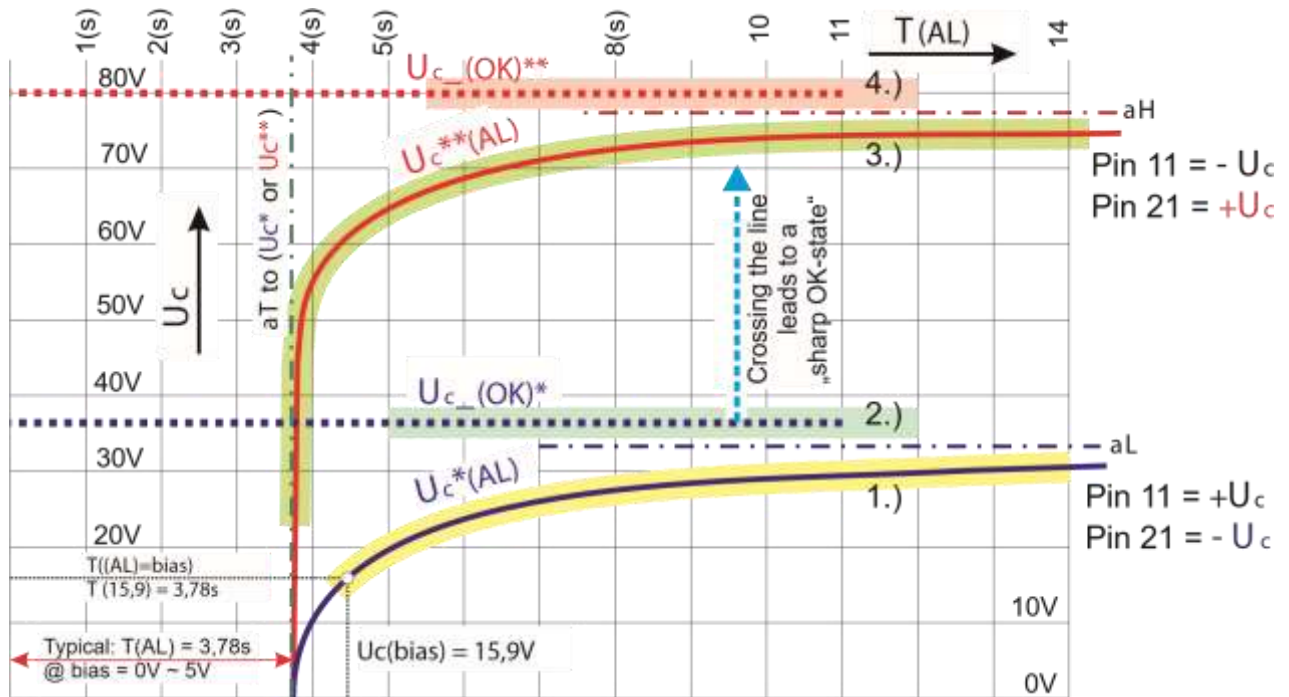


Diagram 1

Diagram 1 shows 4 functions that represent:

Blue function 1.) and line 2.) refer to the „low level threshold“ of the control voltage U_c . The solid blue function in the yellow field shows the maximum value of the control voltage that still causes the alarm. $U_{c(AL)_{max}} = U_{c^*(AL)}$

The dotted blue line shows the minimum input voltage U_c that can keep the relay on. If U_c is greater than $U_{c_(OK)}$, the relay switches on (simultaneously).

The vertical asymptote aT shows the shortest alarm time delay for ideal digital signal.

The negligible deviation of U_c from zero voltage is (3 to 5)V.

Red function 3.) and line 4.) are similar to blue function 1.) and line 2.), with reference to the “higher threshold” of the range U_c .

aH - asymptote for High level of the input control voltage $U_{c^{**}(AL)}$

aL – asymptote for Low level of the input control voltage $U_{c^*(AL)}$

aT – time asymptote for Low and High level of input control voltage U_c (U_{c^*} and $U_{c^{**}}$).

TECHNICAL DATA

	Symbol	Parameter	Conditions	Min.	Nom.	Max.	Unit
Auxiliary Supply	U_{aux}	Supply voltage	Input(18-28) for 220V	142	220	242	V
			Input(18-14) for 125V	80	125	150	V
			Input(18-14) for 110V	75	110	143	V
	I_{aux}	Supply current	U_{aux} Input pin: (18-28)		10,5	14	mA
			U_{aux} Input pin: (18-14)		10,8	12	mA
			U_{aux} Input pin: (18-14)	5	9,1	11	mA
Supervision circuit	$U_c(AL)$	Maximal Supervision Voltage	Polarity: +Uc to pin = 11	26	32	35	V
	$U_c(OK)$	Minimal Supervision Voltage	Polarity: +Uc to pin = 11	36	38	41	V
	$U_c(AL)$	Maximal Supervision Voltage	Polarity: +Uc to pin = 21	73	75	76	V
	$U_c(OK)$	Minimal Supervision Voltage	Polarity: +Uc to pin = 21	77	79	81	V
	U_c	Supervision voltage	Operation range	60	220	264	V
	R_c	Input resistance (11-21)	Input diodes shorted	90	94	98	kohm
	$U_c(OK)$	Low level Limit value:	+ → 11 O.K. range	33	40		V
	$U_c(AL)$	+ U_c = pin11; - U_c = pin21	- → 21 Fault range		25	30	V
	$U_c(OK)$	High level Limit value:	- → 11 O.K. range	75	80		V
	$U_c(AL)$	+ U_c = pin21; - U_c = pin11	+ → 21 Fault range		70	74	V
	$I_c = O.K.$	O.K. – state measuring current in supervision circuit (11-21)	$R_p = 22k; U_c = 47V$	0,4			mA
			$R_p = 0k; U_c = 264V$			2,8	mA
			$R_p = 22k; U_c = 220V$		1,9		mA
	$I_c = Fault$	Fault – state current	$R_p = 0 - 22k$			0,25	mA

TECHNICAL DATA continued

	Symbol	Parameter	Conditions	Min.	Nom.	Max.	Unit
Alarm time delay		Alarm time delay					
	$t_{(Aux=Nom)}$		$U_c = O.K. to 0;$ $U_{aux} = Nominal$	2,8	3,6	4,4	s
	$t_{(Aux=Min)}$		$U_c = O.K. to 0;$ $U_{aux} = Min.$	2,5	3,3	4,1	s
	$t_{(Aux\&Uc-0)}$	Autonom. operation (at disconnection)	$U_c = O.K.;$ $U_{aux} = Nom. to 0$		3,5		s
Turn on time		Turn on time	Reset to O.K. state.				
	$T(0-U_c)$	after the return of U_c	$U_c = 0 to U_{aux} = Nom$	0,008	0,02	0,07	s
	$T(0-U_{aux})$	after the connection of U_{aux} (supply)	$U_c = O.K.;$ $U_{aux} = Nom$	3	4,2	6	s
	R_c	Line resistance in circuit of n.c. auxiliary contact of Circuit Breaker			22		kohm
		Nominal power			3	5	W
Contact data	I_{max}		resistive load			5	A
	U_{max}		50Hz			400	Va.c.
		Safety Voltage insulation	Relay contacts to supervision circuit (11,21) and to auxiliary terminals (18,28/14) Test: 50Hz; 1 minute	2	2,5		kV rms
Ambient		Humidity					
		Operation temperature		-10		+55	°C
		Storage temperature	Standard for electronics devices	-25		+75	°C

CONNECTION DIAGRAMS

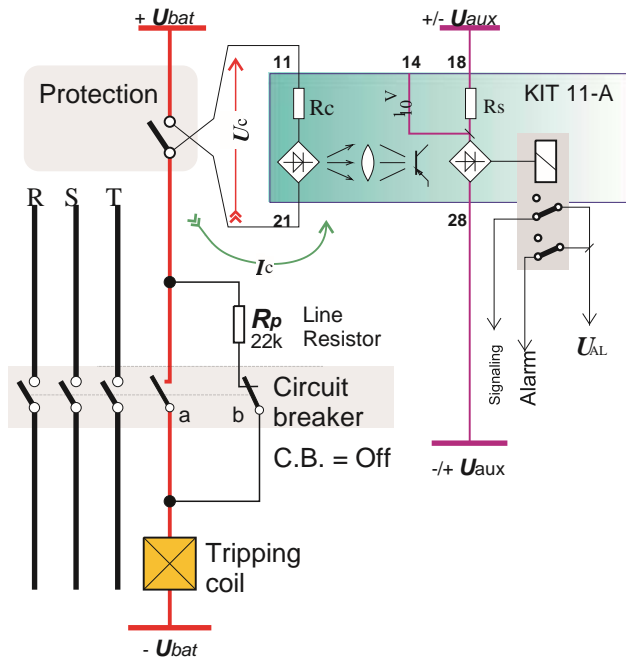


Figure-1

The circuit in Figure-1 shows the supervision current flowing through the actuating coil via contact **b**, which is in the interrupt position of a **C.B.**;

Figures -1 and -2 show the use of one KIT-11A using the line resistor **Rp** to bypass contact **a**. **Uc** is supposed to switch around the **high level** point (81 / 73V).

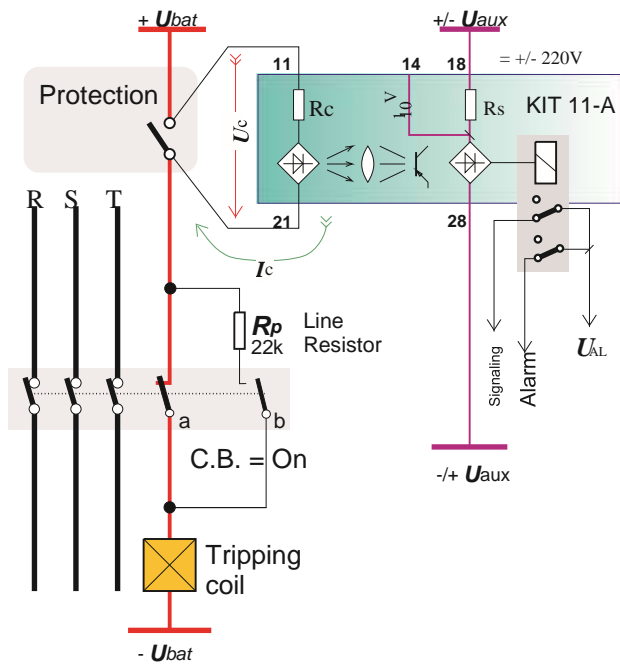


Figure-2

Figure-2 shows the same main parts with two special features:

- **C.B.** is in the closed position and
- The **Uc** connection is adapted to the **low level** decision point (25 / 41V).

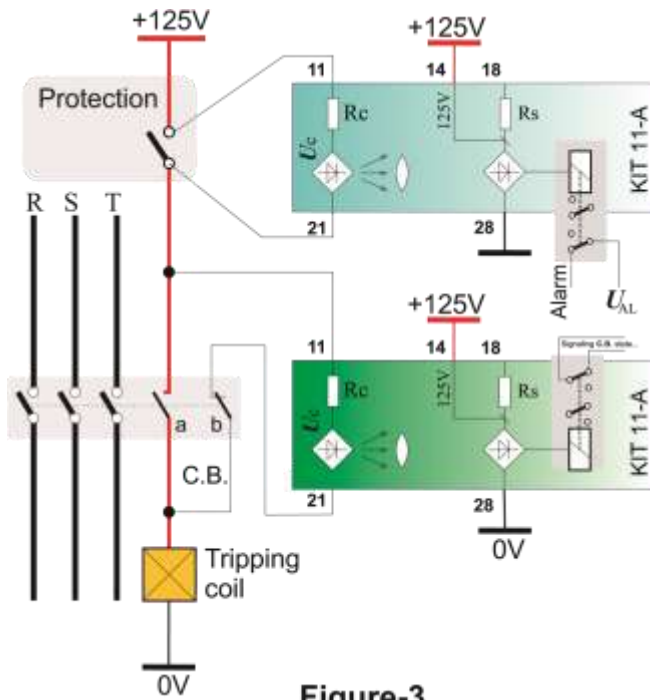


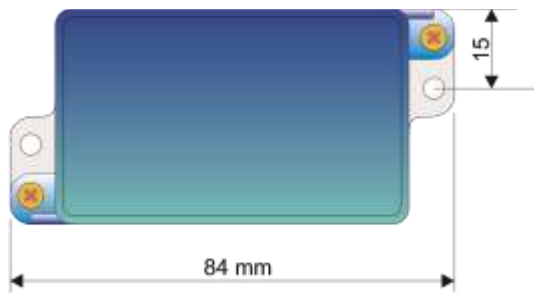
Figure-3 shows an option in which the line resistor R_p is replaced by the input resistor R_c of the other supervision relay KIT-11A (bellow, green).

Figure-3 shows the disconnected C.B.. For both KIT-11A we have selected the **low level** control voltage U_c , to switch around (25/41)V; The supervision current flows through the coil, via contact **b**.

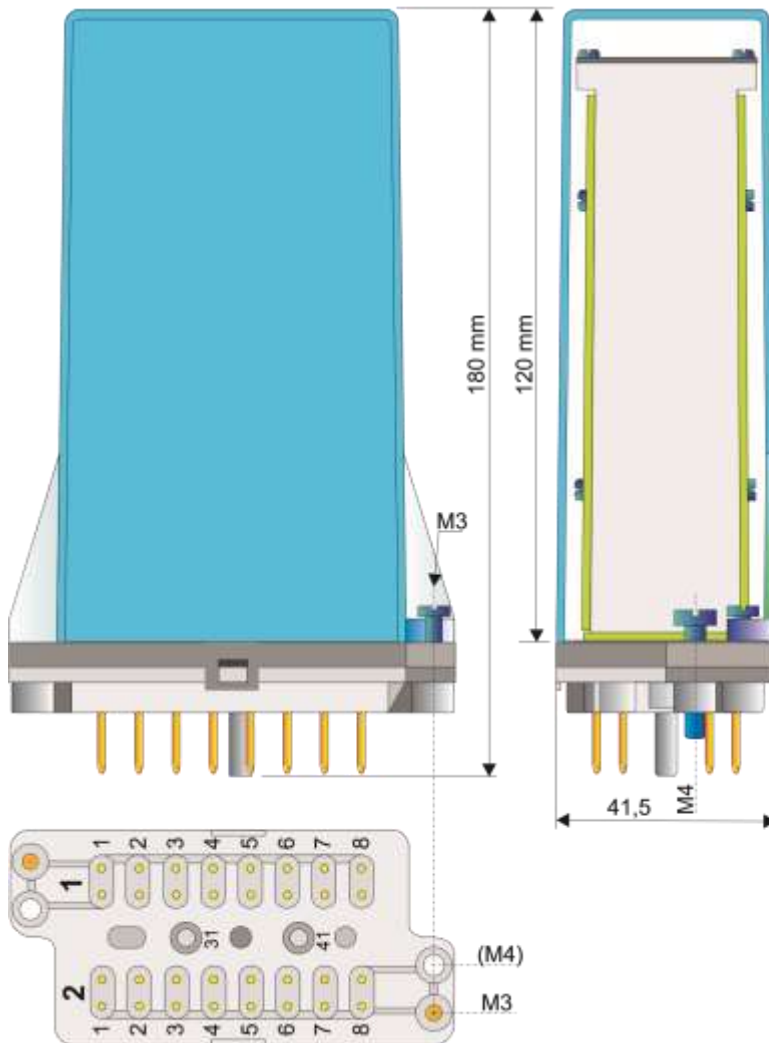
Figure-3 uses two KIT-11A without using a line resistor R_p to bypass contact **a**.

The measuring range of U_c is connected to switch around the **low level** point, to reach: $(41 + 41)V < 125V...$

DIMENSIONS



Housing-HX1
of mechanical Plug in system Combiflex



Weight of relay KIT-11A: 195g
Enclosed line resistor Rp: 4g