

Self-powered Short-circuit Protection**3-PHASE OVER-CURRENT RELAY I3Y-W***replacement for **mechanical momentary relay***

designed inside of the module **HX4**, Combiflex
or inside unit **H4** for wall mounting

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

ORDERING CODE, PRICE

Note:

Bellow listed Prices are subjected to influence of payment conditions and the delivery request.
Price does not include tax.

Ordering Code	Nominal Current	Setting Range	Price €/pcs @ quantity:			
			1	2	4	8>
I3Y-W_E5_ah4	$I_n = 5A$	(10 - 75)A	365	329	309	295
I3Y-W_E1_ah4	$I_n = 1A$	(2 - 20)A				
I3Y-W_E1_HX4	$I_n = 1A$	(2 - 20)A				
I3Y-W_E2,5_ah4	$I_n = 2,5A$	(8 - 40)A	380	361	343	325
I3Y-W_E0,5_ah4	$I_n = 0,5A$	(1 - 10)A				



APPLICATION, DESIGN, FEATURES AND PROPERTIES

APPLICATION

- back up protection;
- no auxiliary battery required;
- basic protection in remote locations, with no men-service;
- replacement for mechanical short circuit relay protection;

The spring intention of “I3Y-”relay’s was, to serve as a top reliable back-up protection or to be used for basic protection on objects of high priority and remote or hard to maintain and un-accessible locations. The above referred real time design ensures the top reliability and the longest expected life time.

DESIGN

Safety presence of long time delayed over-current guarding unit enables very high stand by over current operation, with no danger for thermal overloading of input current measuring path.

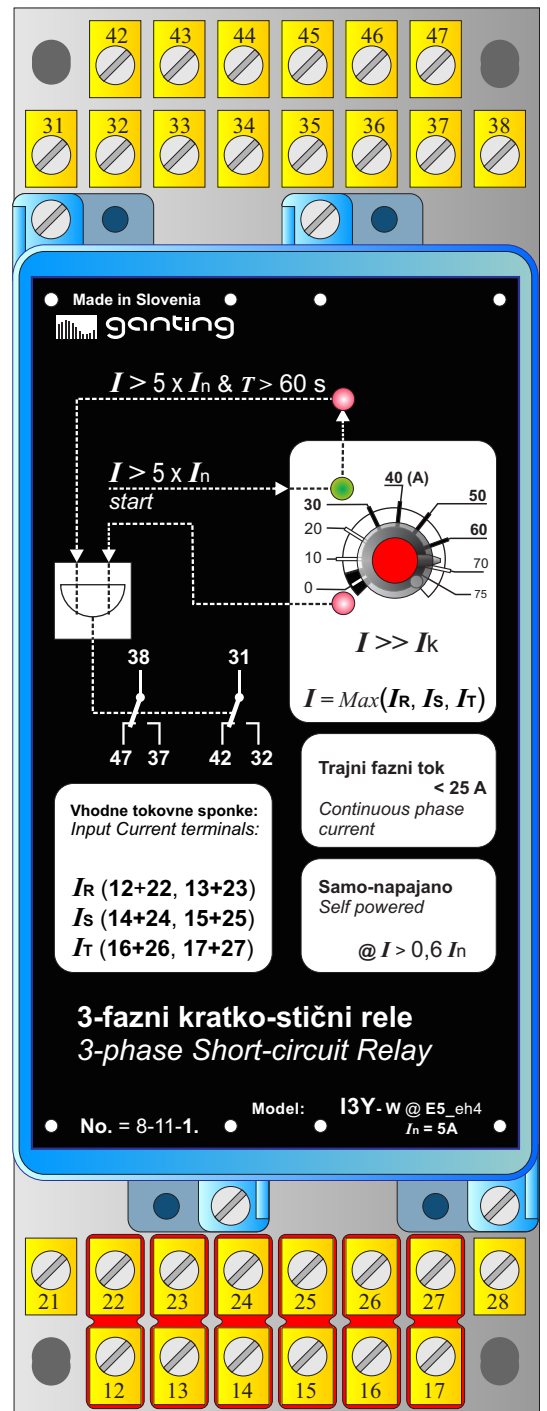
“Bridge current measuring transformer” enables

- self-powering at very low input current
 - All 3 phase currents contribute the power to the central accumulation. United reference system enables minimum number of setting parts what results in economy and in very high reliability;
- SMD technology includes the application of modern micro-power linear operational amplifiers and references.

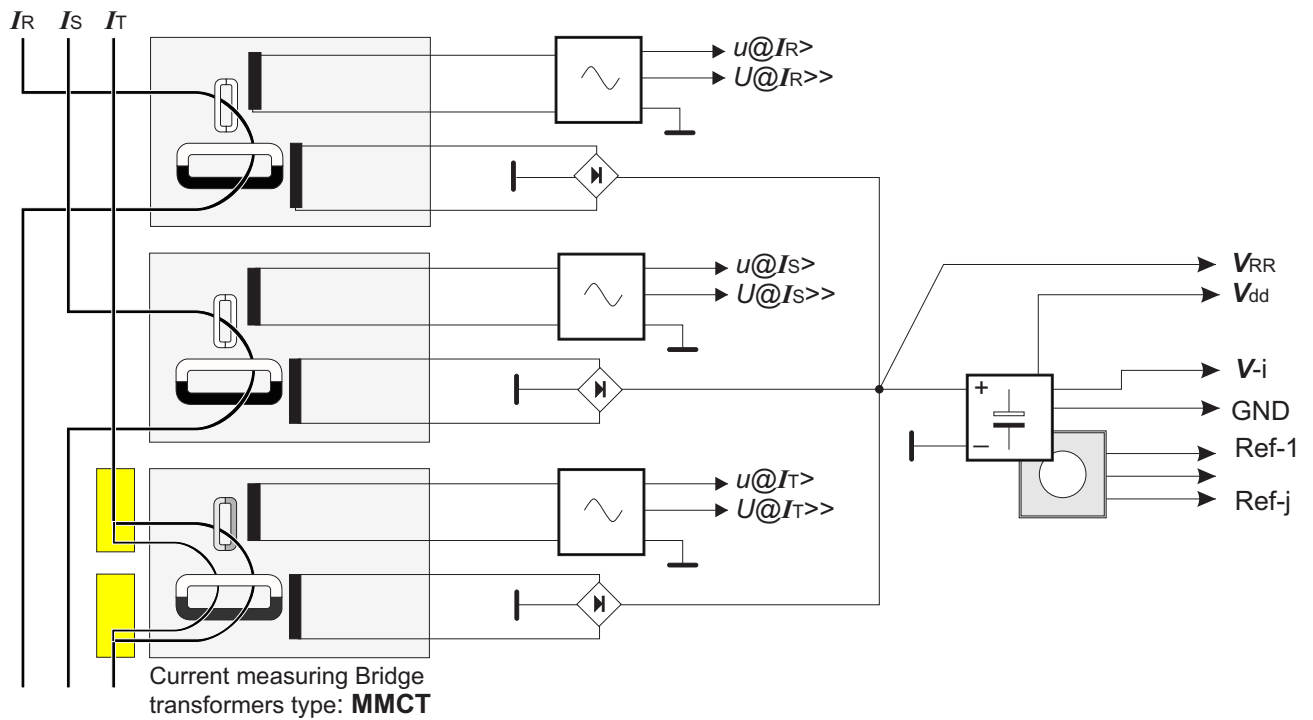
Presented real time relay does not contain any vital parts with the life time less than 20 years for type @E, and 50 years for model @LL.

FEATURES AND PROPERTIES

- Replacement for mechanical short circuit relay protection;
- Short Circuit protection with momentary tripping guarded by
- delayed Over-current operation internally set by producer.
- No auxiliary battery required;
- Self-powering at very low input current (0,5 I_n), even from single phase (0,6 I_n);
- Power supply stabilisation is enabled by c-core saturation, enabling very high standby input currents at relatively low thermal losses.



DESCRIPTION OF OPERATION



Measuring unit with signals($u@IS>$, and $u@IS>>$) scaled for delayed over current and for short circuit measuring circuit.

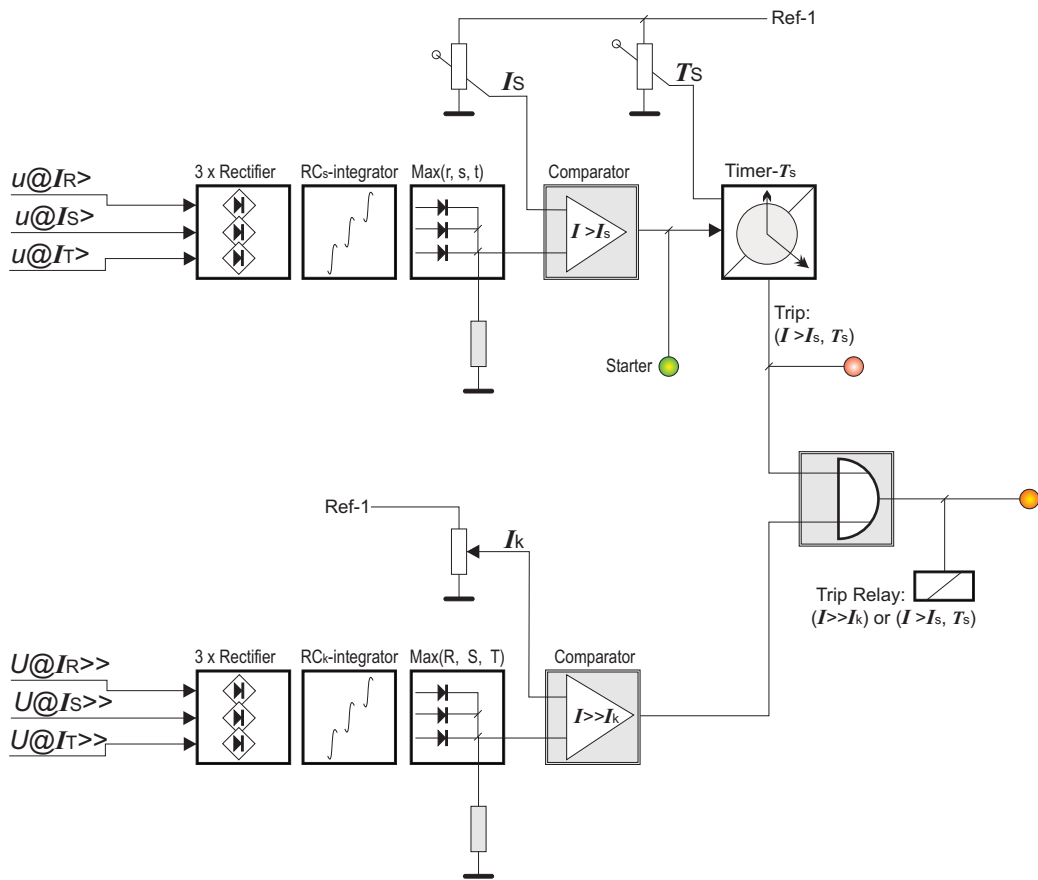
Self-powering unit is storing a bit of energy, to power the output relay and to supply voltages for operational amplifier, logic circuits and for all references for magnitude comparators.

DESCRIPTION OF OPERATION

Delayed o.c. unit, preset by producer, has guarding task to prevent thermal damage mainly to input c.t. and input wires to stay below safety limits and not to rise 105°C, otherwise the Relay's life time would be decreased.

Presented economy model uses simplified attenuations, to determine limits for $I_s = 5I_n$ and for $T_s = 60s$.

Delayed o.c. unit has starter's indicator lamp, announcing that the trip is going to happen via the output relay. The trip relay is either tripped by over current after preset delay time or by short circuit momentary unit.

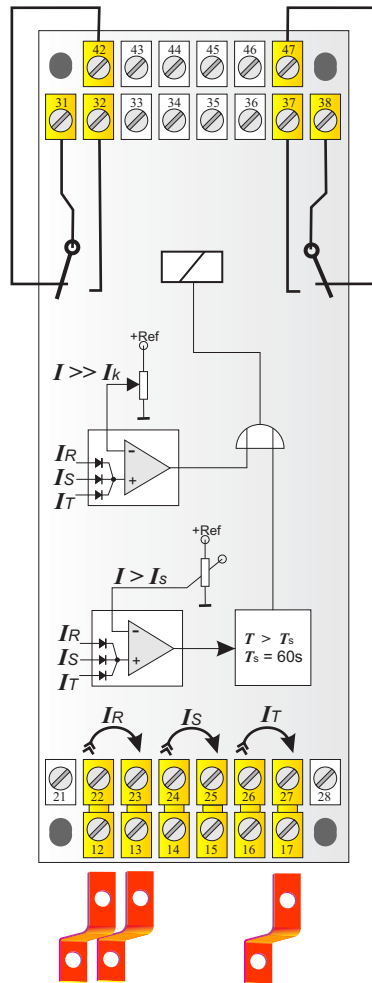


Block diagram

The Short-circuit over current unit has relatively fast integrator to obtain nearly momentary tripping operation.

The tripping time is an $(1/x)$ inverse function of $\Delta I = (I - I_k)$. For input phase current I , exceeding set limit I_k for 3x the tripping time is less than 16 ms, for the integrating constant $R C_k = 100nF \times 115k\Omega$.

Terminal connections for housing H4



Note:

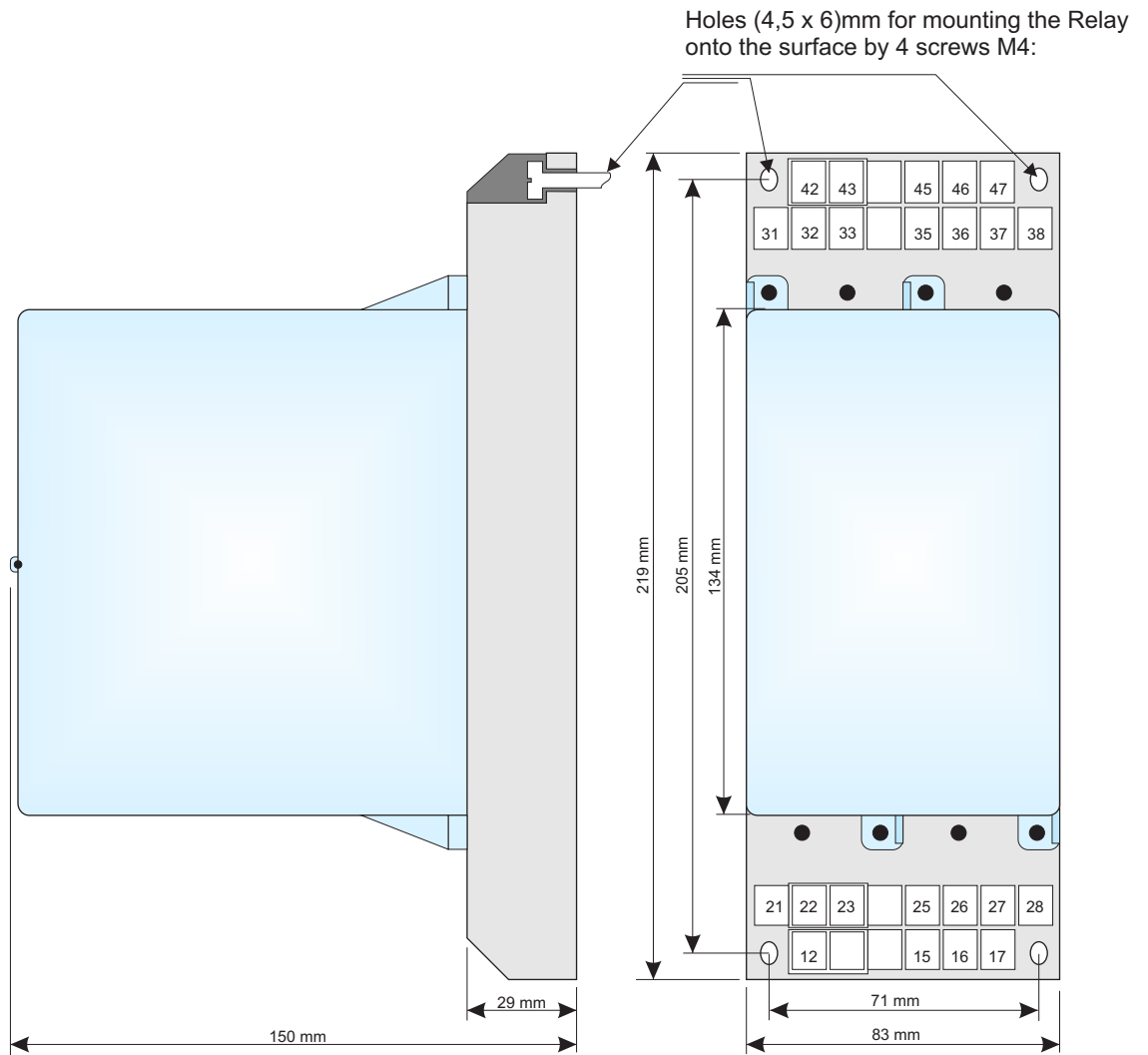
To prevent thermal overloading the Delayed over-current protection „ $I > I_s$ “ has to be added to the basic Short circuit momentary over current protection $I >> I_k$.

Delayed relay has limit value internally set to $5 \times I_n$ @ $I_n = 5A$
or to $7 \times I_n$ @ $I_n = 1A$;

Time delay is internally set to 60 seconds by producer.

Terminals for phase Input current connection are duplicated, to avoid thermal overloading of screw terminals and internal wiring, with wire cross section $4 \times 2,5 \text{ mm}^2$.
Recommended external wire cross section is at least: $2 \times 2,5 \text{ mm}^2$ (for $I_n = 5A$).

Dimensions for wall housing H4



Parameter		Min.	Nom.	Max.	Unit	Conditions
Over-current relay						
Nominal Current	I_n		5 1		A A	On request Recommended
Setting, done by producer	I_s		25 7		A A	for $I_n = 5A$ for $I_n = 1A$
Repetition accuracy			2		%	of scale range
Reset Ratio (pick-up\drop-out)			95		%	of full scale
Time delay setting range	T_s		60		s	set by producer
Repetition accuracy			2		%	on request: (5 - 120)s
Reset Time		50	66	130	ms	of scale range Recovery done
Short circuit protection						
Setting range	I_k	10 2		70 16	A A	$I_n = 5A$ $I_n = 1A$
Pick-up time @ $I(t < t_o) = I$	t_p		22		ms	@prefolt($I = I_n$) & $I = 2 \times I_k$, at $t_k = 0$
Pick-up time @ $I(t < t_o) = 0$	t_{po}		37		ms	@prefolt($I = 0$) & $I = 2 \times I_k$, at $t_k = 0$
Power dissipation						per each Phase
Nominal	P_n			0,5	W	$I = I_n$
Dual				2	W	$I = 2 I_n$
Quard				5	W	$I = 4 I_n$
Continuous phase current	$1 \times I$			5	I_n	dissipation = 10W per housing;
Continuous 3 phase	$3 \times I$			3,2	I_n	@ $T_{Amb} = 20^\circ C$
Ambient Temperature	T_{Amb}	-10		+55	$^\circ C$	operating range
Storage Temperature		+5		+45	$^\circ C$	standard accuracy
		-25		+75	$^\circ C$	
Contact rating:						
Making capability				8	A	L/R < 20 ms; 100V d.c.
Breaking capacity - d.c.				0,05	A	
D.c. Breaking capacity via arc suppressor				5	A	L/R < 40 ms; 264V d.c.
Test Voltage (50Hz; 1min.)				2,5	kVrms	between all d.c. separated circuits

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Pick-up time

of the short circuit relay, regarding
- limit setting on the scale I_k and
- over-current exceeding of the selected

I_k -setting:

Initial, pre-fault current $I(t < t_o) = 2 I_n = 10A$

Ordering Code: I3Y-W_E5_eh4

