Protection trip units and trip curves
PR121/P

User interface

The user communicates directly with the trip unit in the trip parameter preparation stage by means of the dip switches. Up to four LEDs (according to the version) are also available for signalling.

These LEDs (one for each protection) are active when:
- a protection is timing. For protection L the prealarm status is also shown;
- a protection has tripped (the corresponding LED is activated by pressing the "Info/Test" pushbutton);
- a failure in connection of a current sensor or in the opening solenoid is detected. The indication is active when the unit is powered (through current sensors or an auxiliary power supply)
- wrong rating plug for the circuit-breaker.

The protection tripped indication works even with the circuit-breaker open, without the need for any internal or external auxiliary power supply. This information is available for 48 hours of inactivity after the trip and is still available after reclosing. If the query is made more than 48 hours later it is sufficient to connect a PR030/B battery unit, PR010/T, or a BT030 wireless communication unit.

Communication

By means of the BT030 wireless communication unit, PR121/P can be connected to a pocket PC (PDA) or to a personal computer, extending the range of information available for the user. In fact, by means of ABB SACE's SD-Pocket communication software, It is possible to read the values of the currents flowing through the circuit-breaker, the value of the last 20 interrupted currents, and the protection settings.

PR121 can also be connected to the optional external Local Device LD030 DO, for the remote signalling of protections alarms and trips, and to HMI030, for the remote user interfacing.

Setting the neutral

Protection of the neutral can be set at 50%, 100% or 200% of the phase currents. Settings above 50% can be selected for E1-E2-E3-E4/f and E6/f. In particular, setting the neutral at 200% of phase current requires protection L to be set at 0.5In in order to respect the current-carrying capacity of the circuit-breaker. The user can also switch the neutral protection OFF. When three-poles circuit-breakers with external neutral current sensor are used, a setting above 100% for the neutral does not require any reduction in the L setting.

Test Function

The Test function is carried out by means of the info/Test pushbutton and the PR030/B battery unit (or BT030) fitted with a polarized connector housed on the bottom of the box, which allows the device to be connected to the test connector on the front of PR121/P trip units.
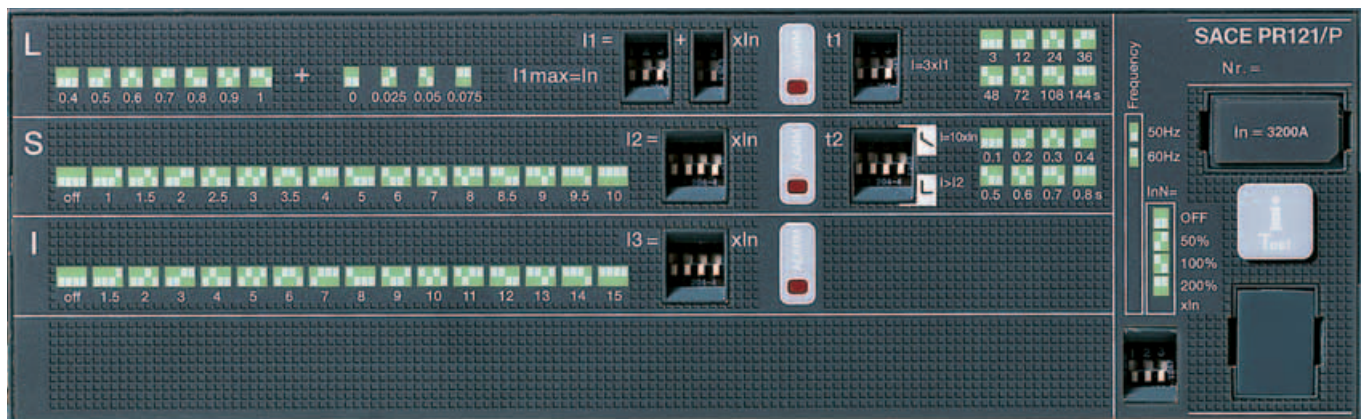
The PR121/P electronic trip unit can be tested by using the SACE PR010/T test and configuration unit by connecting it to the TEST connector.
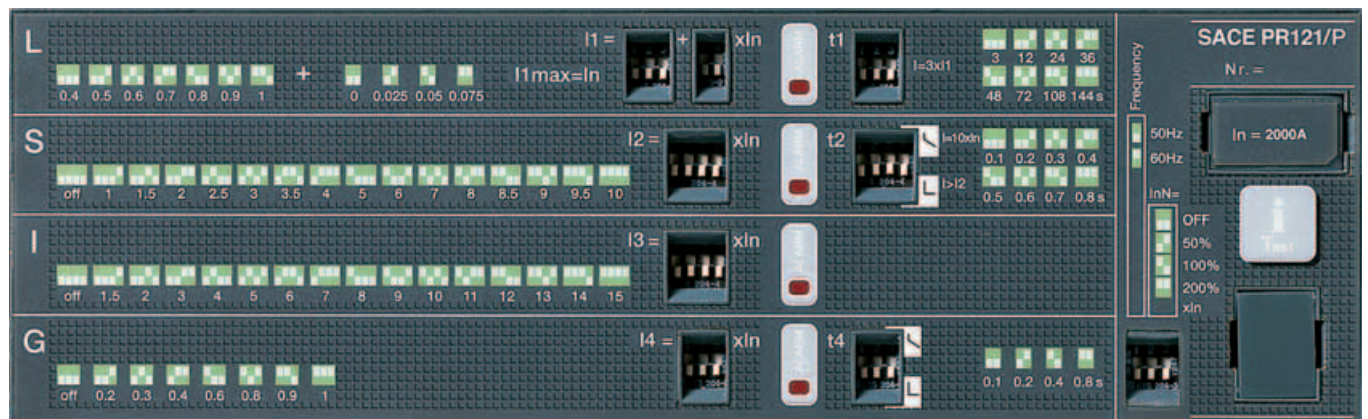
Versions available

The following versions are available:

PR121/P LI

PR121/P LSI

PR121/P LSIG

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Protection functions and setting values - PR121

Function		Trip threshold		Trip time*	Poss. excl.	Relation t=f(I)
L	Overload protection	I1=	0,4 - 0,425 - 0,45 - 0,475 - 0,5 - 0,525 - 0,55 - 0,575 - 0,6 - 0,625 - 0,65 - 0,675 - 0,7 - 0,725 - 0,75 - 0,775 - 0,8 - 0,825 - 0,85 - 0,875 0,9 - 0,925 - 0,95 - 0,975 - 1 x In	With current If = 3 x I1 t1 = 3 - 12 - 24 - 36 - 48 - 72 - 108 - 144 s [1]	–	$t=k/I^2$
	Tolerance [2]		Release between 1.05 and 1.2 x I1	± 10% If ≤ 6 x In		
				± 20% If > 6 x In		
S	Selective short-circuit protection	I2=	1 - 1.5 - 2 - 2.5 - 3 - 3.5 - 4 - 5 6 - 7 - 8 - 8.5 - 9 - 9.5 - 10 x In	With current If > I2 t2 = 0.1 - 0.2 - 0.3 - 0.4 - 0.5 - 0.6 - 0.7 - 0.8 s	•	$t=k$
	Tolerance [2]		± 7% If ≤ 6 x In	The better of the two figures: ± 10% or ± 40 ms		
			± 10% If > 6 x In			
		I2=	1 - 1.5 - 2 - 2.5 - 3 - 3.5 - 4 - 5 6 - 7 - 8 - 8.5 - 9 - 9.5 - 10 x In	With current If = 10 x In t2 = 0.1 - 0.2 - 0.3 - 0.4 - 0.5 - 0.6 - 0.7 - 0.8 s	•	$t=k/I^2$
	Tolerance [2]		± 7% If ≤ 6 x In	± 15% If ≤ 6 x In		
			± 10% If > 6 x In	± 20% If > 6 x In		
I	Instantaneous short-circuit protection	I3=	1,5 - 2 - 3 - 4 - 5 - 6 - 7 - 8 - 9 - 10 - 11 - 12 - 13 - 14 - 15 x In	Instantaneous	•	$t=k$
	Tolerance [2]		± 10%	≤ 30 ms		
G	Earth fault protection	I4=	0.2 - 0.3 - 0.4 - 0.6 - 0.8 - 0.9 - 1 x In	With current If > I4 t4 = 0,1 - 0,2 - 0,4 - 0,8 s	•	$t=k$
	Tolerance [2]		± 7%	The better of the two figures: ± 10% or ± 40 ms		
		I4=	0.2 - 0.3 - 0.4 - 0.6 - 0.8 - 0.9 - 1 x In	t4 = 0.1 @ 4.47 I4, t4 = 0.2 @ 3.16 I4 t4 = 0.4 @ 2.24 I4, t4 = 0.8 @ 1.58 I4	•	$t=k/I^2$
	Tolerance [2]		± 7%	± 15%		

If = fault current
* Referring to the electronics
(1) The minimum trip time is 1 s, regardless of the type of curve set (self-protection)
(2) These tolerances are valid in the following conditions:
  - self-supplied trip unit at full power (without start-up)
  - two- or three-phase power supply
  - trip time set ≥ 100 ms
The following tolerance values apply in all cases not covered by the above:

	Trip threshold	Trip time
L	Release between 1.05 and 1.2 x I1	± 20%
S	± 10%	± 20%
I	± 15%	≤ 60ms
G	± 15%	± 20%

Power supply

The unit does not require an external power supply either for protection functions or for alarm signalling functions. It is self-supplied by means of the current sensors installed on the circuit-breaker. For it to operate, the three phases must be loaded at 70A for E1, E2 and E3 and at 140A for E4 and E6. An external power supply can be connected in order to activate additional features, and in particular for connection to external devices: HMI030, and LD030 DO.

	PR121/P
Auxiliary power supply (galvanically insulated)	24 V DC ± 20%
Maximum ripple	5%
Inrush current @ 24V	~10 A for 5 ms
Rated power @ 24V	~2 W

Functions L-I

Functions L-S-I

$$t = \frac{k}{I^2}$$

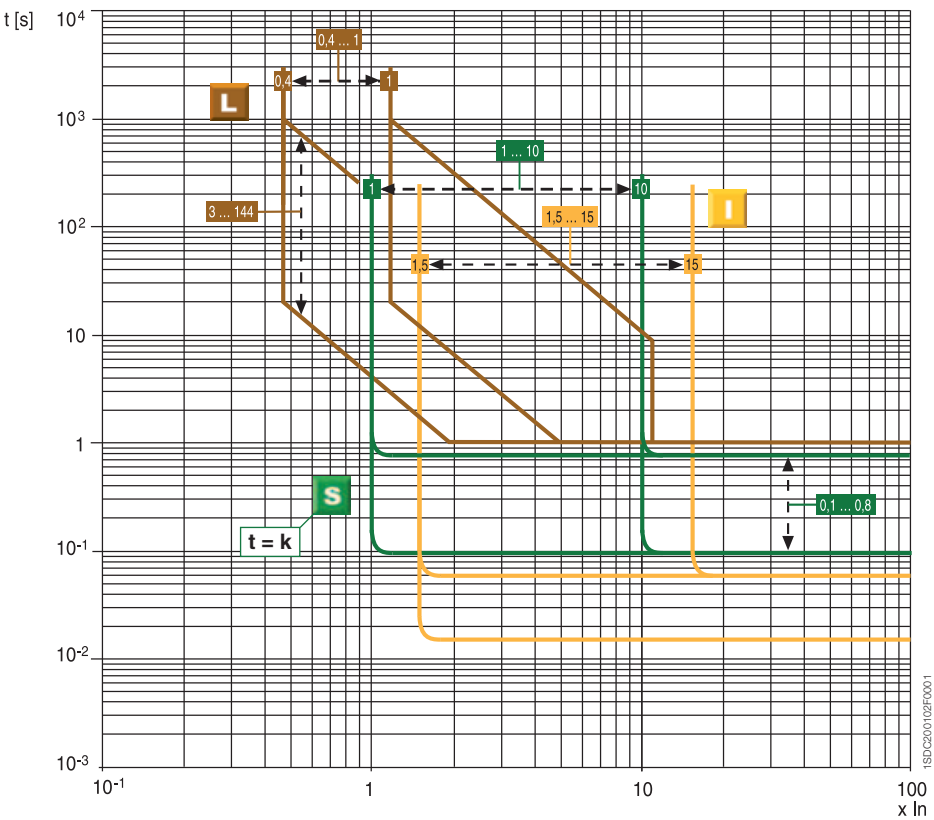Threshold and trip times tolerances
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Functions L-S-I

Function G

Threshold and trip times tolerances
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