




Choice of sensitivity

The sensitivity of an earth leakage protection device depends mainly on the function it has to perform:

- Protection from electric shock by direct contact.
- Protection from electric shock by indirect contact.
- Protection from fire due to current leakage.

The following table gives a reminder of:




- The circuits that must be protected against these various risks (obligation or recommendation).
- The type of earth leakage protection device to be used in each case, its sensitivity, and its location in the distribution diagram.

Type of protection	Obligations		Recommended by Schneider Electric	Sensitivity (I Δ n)		
	National standard <i>To be filled in according to the country standard</i>	International standard IEC 60364		30 mA (*)	100 mA to 3000 mA (depending on the earthing system)	300 mA (or 500 mA)
Protection from electric shock by direct contact						
 <small>DB123167</small>	<i>To be filled in according to the country standard</i>	Power supply for <ul style="list-style-type: none"> ■ General-purpose power sockets, up to 20 A ■ Appliances in the vicinity of a bathtub, shower, pond or swimming pool ■ Portable appliances for outdoor use, up to 32 A ■ Lighting for exhibition stands and shows ■ Outdoor lighting <i>To be modified according to national obligations (above)</i>	<ul style="list-style-type: none"> ■ Lighting in the home 	Setup in final distribution switchboard <ul style="list-style-type: none"> ■ Residual current device protecting a circuit ■ Residual current circuit breaker protecting a group of circuits 		
Protection from electric shock by indirect contact						
 <small>DB123168</small>	<i>To be filled in according to the country standard</i>	The entire power distribution system, except for devices: <ul style="list-style-type: none"> ■ With class II insulation ■ Operating at Safety Extra Low Voltage (class III) <i>To be modified according to national obligations (above)</i>	–	Setup in final distribution switchboard <ul style="list-style-type: none"> ■ Residual current circuit breaker or device, on incoming feeder Setup in subdistribution board or main switchboard <ul style="list-style-type: none"> ■ Residual current device protecting a circuit ■ Residual current device or circuit breaker protecting a group of circuits ■ On incoming feeder: residual current circuit breaker or device 		
Protection from fire due to current leakage						
 <small>DB123169</small>	<i>To be filled in according to the country standard</i>	<ul style="list-style-type: none"> ■ High-risk premises: <ul style="list-style-type: none"> □ explosion (BE3) □ fire (BE2) ■ Agricultural and horticultural buildings ■ Equipment for fairs, exhibitions and shows ■ Temporary outdoor recreational installations <i>To be modified according to national obligations (above)</i>	<ul style="list-style-type: none"> ■ Dilapidated buildings or electrical installations ■ Humid atmospheres: agricultural buildings, public swimming pools ■ Presence of chemical agents 			Setup in final distribution switchboard <ul style="list-style-type: none"> ■ Residual current circuit breaker or device, on incoming feeder Setup in subdistribution board or main switchboard <ul style="list-style-type: none"> ■ Residual current device protecting each circuit to a high-risk zone ■ Residual current device or circuit breaker protecting a group of circuits ■ On incoming feeder: residual current circuit breaker or device

(*) The 10 mA sensitivity is useful for certain very specific applications, where there is a risk that someone could sustain a non-dangerous current (10 to 30 mA) without being able to get free. Example: healthcare equipment for hospital beds. Generally, devices with this very high sensitivity are liable to cause frequent tripping, due to the natural leakage currents of the installation.

Interference immunity

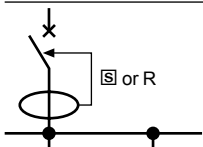
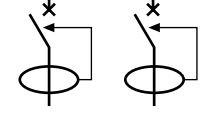

Schneider Electric provides various equipment technologies capable of overcoming the consequences of interference of all kinds.

Operating conditions		Examples	Types				
			AC	A	SI	B	
Loads							
	With no special characteristics	<ul style="list-style-type: none"> General-purpose power sockets Incandescent lighting Household appliances: microwave oven, dishwasher, clothes dryer Electric heating, water heater 	■	■	■	■	
	Including a rectifier	Single phase	<ul style="list-style-type: none"> Household appliances: induction cooking appliances, washing machines (variable speed) Single-phase variable speed drives 	-	■	■	-
		Three phase	<ul style="list-style-type: none"> Three-phase variable speed industrial drives Three-phase uninterruptible power supplies 	-	-	-	■
	Generating high-frequency interference (current peaks, harmonics)		<ul style="list-style-type: none"> Fluorescent lighting powered by extra low voltage transformer, by electronic ballast Variable luminosity lighting Powerful IT equipment Single-phase variable speed industrial drives Air conditioning Telecommunications equipment Capacitor banks 	-	-	■	■
	Including an anti-harmonic filter in the power supply		<ul style="list-style-type: none"> Microcomputer systems Computer peripherals (printers, scanners, etc.) 	-	-	■	■
Electrical environment							
	Vicinity of equipment generating transient overvoltages	<ul style="list-style-type: none"> High-powered switching devices Reactive energy compensation banks 	-	-	■	■	
	Circuits powered by an uninterruptible power supply "Isolated neutral" (IT) earthing system	<ul style="list-style-type: none"> Backed-up networks 	-	-	■	■	
	Major risk of lightning strokes	<ul style="list-style-type: none"> Buildings protected by a lightning protection system Mountainous or humid regions Regions with high keraunic level 	-	-	■	■	
Atmosphere							
	Ambient temperature which could be less than -5°C	-	-	■	■	■	
	Presence of corrosive agents (AF2 to AF4) or dust	<ul style="list-style-type: none"> Indoor swimming pools Yacht harbours, marinas, camping grounds Water treatment Chemical industries, heavy industries, paper mills Mines and cellars, road tunnels Markets, stock raising, food processing industries 	-	-	■ (1)	-	

(1) SiE for C120 and NG125 circuit-breakers

Discrimination

Residual current devices of average sensitivity (100 mA and more) are available in a selective (S) and delayed (R) version. This option ensures that, in the event of an earth fault downstream of the installation, only the defective part is switched off. The table below shows (in green) which upstream/downstream equipment combinations provide this discrimination.

Sensitivity (mA) - Downstream		Sensitivity (mA) - Upstream												
		Instantaneous						Selective S			Delayed R			
		30	100	300	500	1000	3000	100	300	500	1000	3000	1000	3000
	Instantaneous	30	-	-	-	-	-	-	-	-	-	-	-	-
		100	-	-	-	-	-	-	-	-	-	-	-	-
		300	-	-	-	-	-	-	-	-	-	-	-	-
		500	-	-	-	-	-	-	-	-	-	-	-	-
		1000	-	-	-	-	-	-	-	-	-	-	-	-
		3000	-	-	-	-	-	-	-	-	-	-	-	-
	Selective S	100	-	-	-	-	-	-	-	-	-	-	-	
		300	-	-	-	-	-	-	-	-	-	-	-	
		500	-	-	-	-	-	-	-	-	-	-	-	
		1000	-	-	-	-	-	-	-	-	-	-	-	
		3000	-	-	-	-	-	-	-	-	-	-	-	
		Delayed R	1000	-	-	-	-	-	-	-	-	-	-	-
		3000	-	-	-	-	-	-	-	-	-	-	-	