Residual current protection without unwanted tripping
AP range of RCCB and RCD blocks

2CSC421002B0201

The problem

Unwanted nuisance tripping

If there is disturbance on the electric network, RCCBs or RCD blocks which are normally in the installation trip and interrupt the circuit even if there is no real fault.

Disturbance of this kind is most commonly caused by:

- operational discharges produced by connecting or disconnecting of loads (opening or closing of protection and command devices, starting and stopping of motors, switching on and off of fluorescent lighting, etc.); if conditions in the circuit are abruptly modified, this causes temporary disturbances such as impulse voltages at high frequency;
- atmospheric discharges caused by direct or indirect lightning onto the power line; when lightning strikes, it generates an electromagnetic field which produces a transient impulse voltage in the network; this generates capacitive earth leakage in the network cables.

In these circumstances, the nuisance tripping of the residual current protection device is unwanted since it does not prevent the risks caused by direct and indirect contact.
A sudden and unjustified cut off of the power supply, on the other hand, may cause very serious problems and jeopardize the continuity of service of refrigerators, freezers, computers, lighting and air-conditioning systems, burglar alarms, data transmission systems, etc.

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Standards

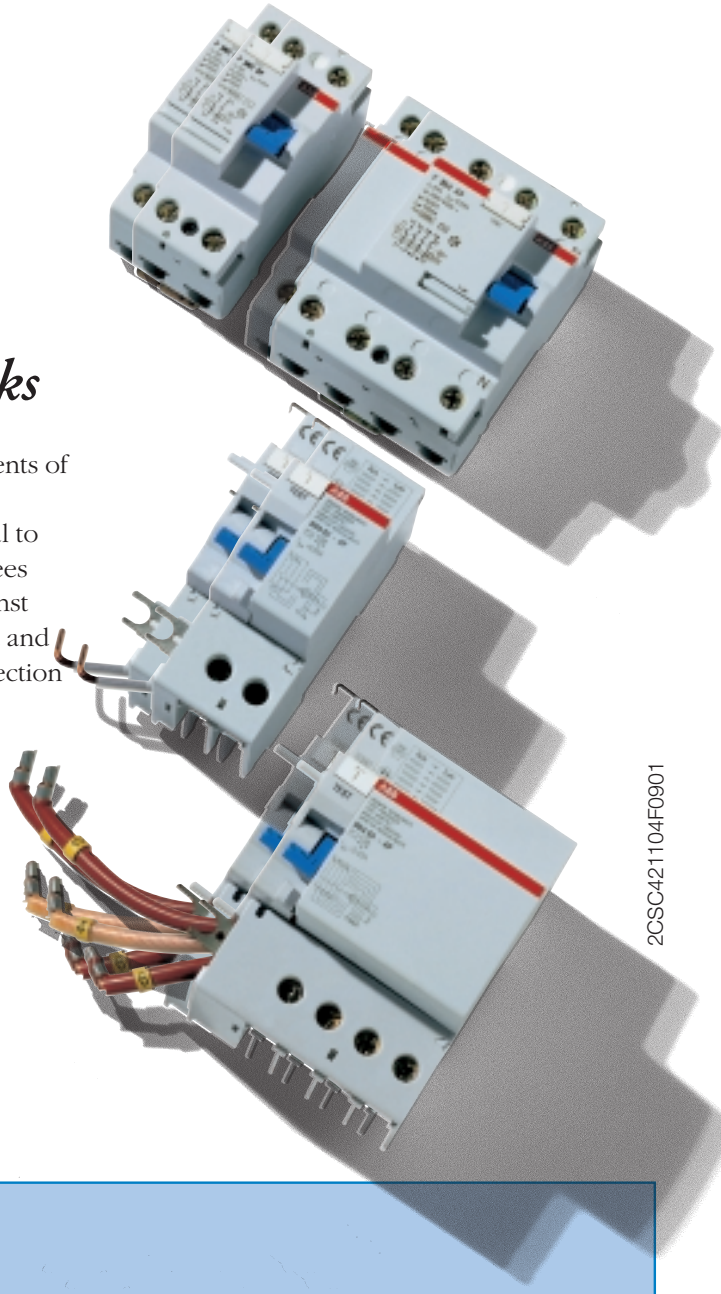
The IEC 61008 and IEC 61009 standards impose the use of a 0.5 µs/ 100 kHz damped oscillator wave (ring wave) to test the ability of residual current protection devices to withstand operational discharges. All RCCBs and RCD blocks must pass the test with a peak current equal to 200 A.
With regard to atmospheric discharges, IEC 61008 and 61009 standards establish the 8/20 µs surge current test with 3000 A peak current but limit the requirement to residual current protection devices classified as selective. No test is required for other types.

The ABB solution

AP range of RCCB and RCD blocks

The AP range of anti-nuisance tripping RCCBs and RCD blocks of ABB SACE pass the ring wave test at 0.5 µs/100 kHz and also withstand the 8/20 µs impulse with the same peak current of 3000 A prescribed for selective devices. For this reason, they offer the most direct solution to the problem of unwanted tripping caused by atmospheric or operational discharges.
The electronic components they are equipped with is capable of distinguishing between temporary leakage caused by network disturbances and permanent leakage caused by actual faults and only opens the circuit if the latter occurs.
A slight delay in the tripping time has also been introduced into the AP range of RCCBs and RCD blocks which nevertheless respects the safety limits imposed by the standards (tripping time at 2 IΔn ≤ 150 ms). When installed in electric circuits, they therefore prevent unwanted tripping in installations in the residential and commercial sector where continuity of service is important and, at the same time, guarantee traditional residual current protection.

The AP range of RCCBs and RCD blocks are available in A and AC types and in 2P and 4P versions with rated currents of 25 A and 63 A. Sensitivity equal to 30 mA guarantees protection against indirect contact and additional protection against direct contact.



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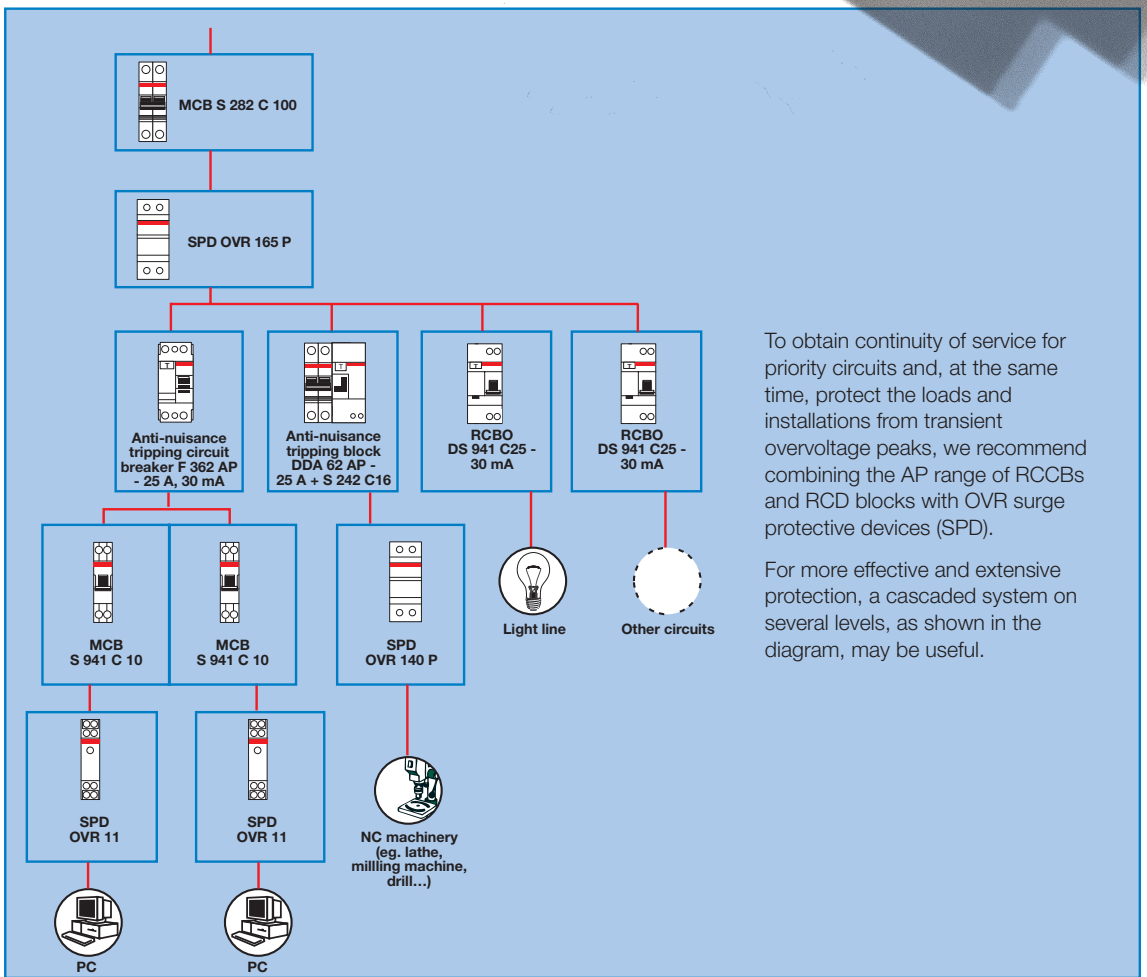

To obtain continuity of service for priority circuits and, at the same time, protect the loads and installations from transient overvoltage peaks, we recommend combining the AP range of RCCBs and RCD blocks with OVR surge protective devices (SPD).

For more effective and extensive protection, a cascaded system on several levels, as shown in the diagram, may be useful.

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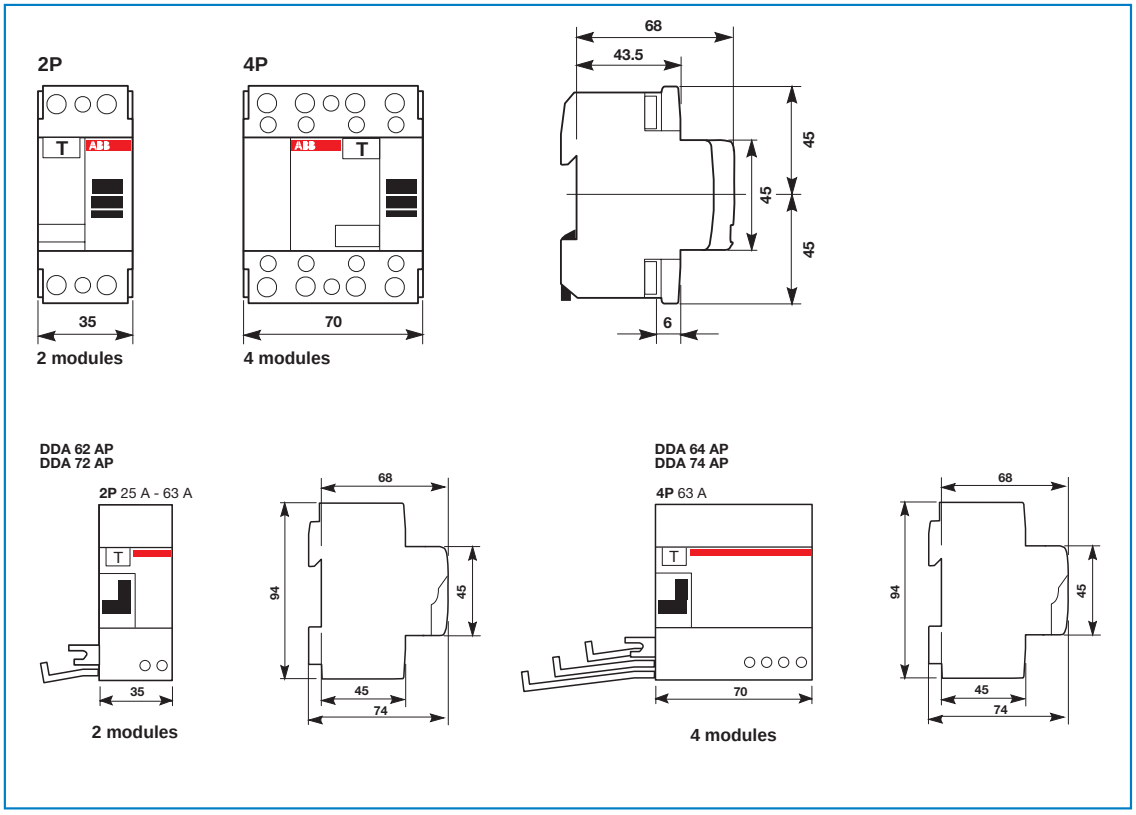
Technical characteristics

			DDA60 AP	DDA70 AP	F360 AP	F370 AP
Standards			IEC 61008 – IEC 61009			
Type			AC	A	AC	A
Size		[A]	25, 63			
No. of poles			2,4			
Rated voltage Ue - AC		[V]	230/400			
Max. operating voltage, Ub max		[V]	440			
Min. operating voltage, Ub min		[V]	195		110	
Rated residual	2P	[kA]	-		0.5	1.5
breaking capacity IΔm	4P	[kA]	-		1.5	1.5
	with S240	[kA]	4.5			
	with S250	[kA]	6		5	5
	with S270	[kA]	7.5		6	6
	with S280 (In 10..25A)	[kA]	12.5		6	6
	with S280 (In 32..63A)	[kA]	7.5		6	6
	with S290	[kA]	7.5		5	5
Voltage withstanding	impulse (1.2/50)	[kV]	5		6	
capacity	at rated frequency. (1 min)	[kV]	3		2.5	
Max. oper. voltage of circuit test		[V]	440		254	
Min. oper. voltage of circuit test		[V]	195		110	
Surge current resistance			3000 A peak (8/20μs wave)			
Rated frequency		[Hz]	50…60			
Rated sensitivity IΔn		[A]	0.03			
Tripping threshold	AC type		0.5…1 IΔn	0.5…1 IΔn	0.5…1 IΔn	0.5…1 IΔn
	A type			0.11…1.4 IΔn		0.11…1.4 IΔn
Dissipated power per pole	2P 25A	[W]	2.5		1	
	2P 63A	[W]	3		2.8	
	4P 25A	[W]	-		1	
	4P 63A	[W]	3.5		3.2	
Resistance per pole	2P 25A	[mΩ]	4		1.6	
	2P 63A	[mΩ]	0.7		0.7	
	4P 25A	[mΩ]	-		1.6	
	4P 63A	[mΩ]	0.9		0.8	
Toggle			Blue, operating only from OFF position		Blue, sealable in ON-OFF position	
Electrical life			10000			
Mechanical life			20000			
Protection degree	housing		IP4X/IPXXD (installed)			
	terminals		IP2X/IPXXB (frontal)			
Self-extinguishing degree			V0 thickness 1.6 UL 94 yellow paper			
Mechanical shock resistance			26 g half wave, duration 6 ms, 2000 shocks			
Resistance to vibrations acc. to IEC 68-2-6			Minimum 5 g, duration 30 minutes, frequency 0…80Hz			
Tropicalization		[°C/RH]	Humid heat 28 cycles with 55/95…100			
acc. IEC 68-2		[°C/RH]	Constant climatic conditions 23/83 – 40/93 – 55/20			
		[°C/RH]	Variable climatic conditions 25/95 – 40/95			
Ambient temperature		[°C]	-5…+55			
Storage temperature		[°C]	-20…+70			
Terminal size		[mm^2]	25			
Mounting			on DIN EN 50022 rail (35 mm)			
Weight	2P	[g]	190/210		345/355	
	4P	[g]	270/330		460	

Order codes

DESCRIPTION	ORDER CODE	SINGLE EAN CODE	MULTIPLE EAN CODE
DDA62 AP 25A 30mA	16259490	8012542517207	8012542517214
DDA62 AP 63A 30mA	16259508	8012542517306	8012542517313
DDA64 AP 63A 30mA	16259482	8012542517108	8012542517115
DDA72 AP 25A 30mA	16259516	8012542517405	8012542517412
DDA72 AP 63A 30mA	16258880	8012542510901	8012542510918
DDA74 AP 63A 30mA	16258872	8012542511007	8012542511014
F362 AP 25A 30mA	16256678	8012542516705	8012542516712
F362 AP 63A 30mA	16256553	8012542510505	8012542510512
F364 AP 25A 30mA	16256694	8012542516903	8012542516910
F364 AP 63A 30mA	16256579	8012542510703	8012542510710
F372 AP 25A 30mA	16256686	8012542516804	8012542516811
F372 AP 63A 30mA	16256561	8012542510604	8012542510611
F374 AP 25A 30mA	16256702	8012542517009	8012542517016
F374 AP 63A 30mA	16256587	8012542510802	8012542510819

Overall dimensions



2CSC421105F0201

2CSC421002B0201 - 04-02
Printed in Italy
Tipografia

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