Electrical distribution

LV product characteristics

Load Protection
> Surge Arrester

Schneider Electric

General contents

iPRF1 12.5r/PRF1 Master/ PRD1 25r/PRD1 Master

Type 1 and 2 LV surge arresters

The Type 1 range of surge arresters meets the normative withstand capability of current wave type 10/350 µs (8/20 µs for Type 2 surge arresters).
It is suitable for use with TT, TN-S, TN-C and 230 V IT earthing connection systems (neutral point connection).
In addition, the PRF1 Master surge arrester covers the 400 V IT system.
iPRF1 12.5r and PRD1 surge arresters are fitted with a remote transfer contact to send "end-of-life indication" information.
PRD1 surge arresters are fitted with easy-to-replace withdrawable cartridges.

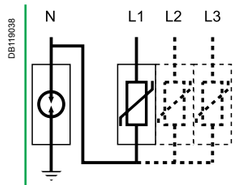
iPRF1 12.5r

PRD1 25r

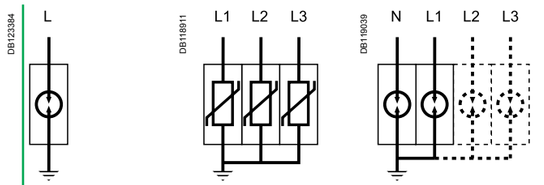
PRD1 Master

iPRF1 12.5r/PRF1 Master/PRD1 25r/PRD1 Master

The Type 1 surge arrester is recommended for electrical installations in the service sector and industrial buildings protected by a lightning conductor or by a meshed cage.
It protects electrical installations against direct lightning strikes.
It is used to conduct the direct lightning current, propagating from the earth conductor to the network conductors.
It must be installed with an upstream disconnection device, such as a fuse or circuit-breaker, whose breaking capacity must be at least equal to the maximum prospective short-circuit current at the installation point.
iPRF1 12.5r and PRD1 25r surge arresters also provide Type 2 protection and protect the electrical installation by finely clipping the lightning wave overvoltages.

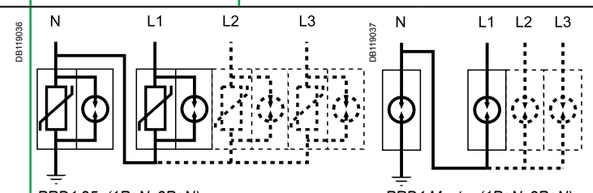


iPRF1 12.5r (1P+N, 3P+N)

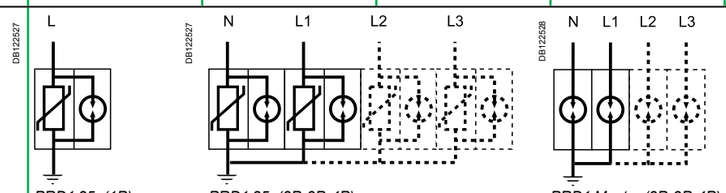


PRF1 Master (1P) *iPRF1 12.5r (3P)* *PRF1 Master (2P, 3P, 4P)*

Type	Product solution						Neutral point connection	Recommended accessory
Fixed surge arrester	**1P+N**	**3P+N**	**1P**	**2P**	**3P**	**4P**		
iPRF1 12.5r T1, T2	**A9L16632**	**A9L16634**					TT, TN-S	
					A9L16633		TN-C, IT 230 V	
PRF1 Master T1				2 x **16630**			IT (1) distributed neutral	**16643**
			16630		3 x **16630**		IT (1) non-distributed neutral	**16644**
						4 x **16630**	IT (1) distributed neutral	**16645**



PRD1 25r (1P+N, 3P+N) *PRD1 Master (1P+N, 3P+N)*



PRD1 25r (1P) *PRD1 25r (2P, 3P, 4P)* *PRD1 Master (2P, 3P, 4P)*

Cartridge surge arrester	**1P+N**	**3P+N**	**1P**	**2P**	**3P**	**4P**		
PRD1 25r T1 + T2	**16330**	**16332**					TT, TN-S	
				2 x **16329**		4 x **16329**	IT 230 V	
			16329		**16331**		TN-C, IT 230 V	
PRD1 Master T1	**16361**	**16363**					TT, TN-S	
			16360	2 x **16360**	**16362**	4 x **16360**	TN-C, IT 230 V	

(1) Version without indicator light.

Protection
Load protection

iPRF1 12.5r/PRF1 Master/ PRD1 25r/PRD1 Master

Type 1 and 2 LV surge arresters (cont.)

iPRF1 12.5r/PRF1 Master/ PRD1 25r/PRD1 Master

Type 1 and 2 LV surge arresters (cont.)

Type	Nb. of poles	Width	I imp (kA) (10/350) Impulse current		I max (kA) (8/20) Maximal discharge current	In - kA Rated discharge current	Up - kV Degree of protection	Un - V Nominal line voltage	Uc - V Maximum steady state voltage	
Fixed surge arrester		**9 mm modules**	**Surge arrester**	**Surge arrester + disconnector**						
iPRF1 12.5r	**Type** 1 + 2									
	1P+N	4	12.5/50 N/PE		50	25	1.5	230	350	**A9L16632**
	3P	8	12.5		50	25	1.5	230 / 400	350	**A9L16633**
	3P+N	8	12.5/50 N/PE		50	25	1.5	230 / 400	350	**A9L16634**
PRF1 Master	**Type** 1									
	1P	4	50	35	-	50	1.5	230	440	**16630**
Withdrawable surge arrester										
PRD1 25r	**Type** 1 + 2									
	1P	4	25		40	25	1.5	230	350	**16329**
	1P+N	8	25/100 N/PE		40	25	1.5	230/400	350	**16330**
	3P	12	25		40	25	1.5	230	350	**16331**
	3P+N	16	25/100 N/PE		40	25	1.5	230/400	350	**16332**
PRD1 Master	**Type** 1									
	1P	4	25		-	25	1.5	230	350	**16360**
	1P+N	8	25/100 N/PE		-	25	1.5	230/400	350	**16361**
	3P	12	25		-	25	1.5	230	350	**16362**
	3P+N	16	25/100 N/PE		-	25	1.5	230/400	350	**16363**
Spare cartridge										
C1 Master-350	-	4	-	-	-	25	1.5	-	350	**16314**
C1 25-350	-	23 mm	-	-	-	25	1.5	-	350	**16315**
C2 40-350	-	12 mm	-	-	-	20	1.4	-	350	**16316**
C1 Neutral-350	-	4	-	-	-	-	-	-	350	**16317**

Surge arresters	Spare cartridge		
	Phase		Neutral
	Type 1	Type 2	
PRD1 25r			
PRD1 25r 1P	**16315**	**16316**	-
PRD1 25r 1P+N	**16315**	**16316**	**16317**
PRD1 25r 3P	3 x **16315**	3 x **16316**	-
PRD1 25r 3P+N	3 x **16315**	3 x **16316**	**16317**
PRD1 Master			
PRD1 Master 1P	**16314**	-	-
PRD1 Master 1P+N	**16314**	-	**16317**
PRD1 Master 3P	3 x **16314**	-	-
PRD1 Master 3P+N	3 x **16314**	-	**16317**

DB123370

Accessories		
Type	**Number of poles**	
4P Wiring comb busbars	4	**16643**
6P Wiring comb busbars	6	**16644**
Peignes de câblage 8P	8	**16645**
200 mm flexible cable (PRF1 Master)		**16646**

Protection
Load protection

iPRF1 12.5r/PRF1 Master/ PRD1 25r/PRD1 Master
Type 1 and 2 LV surge arresters (cont.)

Technical data

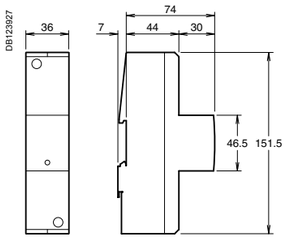
		iPRF1 12.5r	PRF1 Master	PRD1 25r	PRD1 Master
Operating frequency		50 Hz	50/60 Hz	50 Hz	50 Hz
Degree of protection	Front panel	IP40	IP40	IP40	IP40
	Terminals	IP20	IP20	IP20	IP20
	Impacts	IK05	IK05	IK05	IK05
Response time		⩽ 25 ns	⩽ 1 µs	⩽ 25 ns	⩽ 100 ns
End-of-life indication		Green: correct operation	-	White: correct operation	White: correct operation
		Red: at end of life	-	Red: at end of life	Red: at end of life
	Remote notification	1.5 A/250 V AC	-	1 A/250 V AC. 0.2 A/125 V DC	1 A/250 V AC. 0.2 A/125 V DC
By tunnel terminal	Rigid cable	10...35 mm²	10...50 mm²	2.5...35 mm²	10...35 mm²
	Flexible cable	10...25 mm²	10...35 mm²	2.5...25 mm²	10...25 mm²
Operating temperature		-25°C to +60°C	-40°C to +85°C	-25°C to +60°C	-25°C to +60°C
Standards	Type 1	IEC 61643-1 T1. EN 61643-11 Type 1	IEC 61643-1 T1. EN 61643-11 Type 1	IEC 61643-1 T1. EN 61643-11 Type 1	IEC 61643-1 T1. EN 61643-11 Type 1
	Type 2	IEC 61643-1 T2. EN 61643-11 Type 2	-	IEC 61643-1 T2. EN 61643-11 Type 2	-
Certification		CE	KEMAKEUR, CE	KEMAKEUR, CE	CE

Choice of disconnector / surge arrester						
Type	**Iimp :impulse current**	**Isc: prospective short-circuit current at the installation point**				
		10 kA	**15 kA**	**25 kA**	**36 kA**	**50 kA**
iPRF1 12.5r	12.5 kA	C120N 80 A curve C	C120H 80 A curve C or NG125N 80 A curve C	NG125N 80 A curve C	NG125H 80 A curve C	NG125L 80 A curve C
PRF1 Master	35 kA	Compact NSX160B 160 A TM			Compact NSX160F 160 A	Compact NSX160N 160 A
PRD1 25r	25 kA	NG125N 80 A curve C			-	
PRD1 Master	25 kA	NG125N 80 A curve C			NG125H 80 A curve C	NG125L 80 A curve C

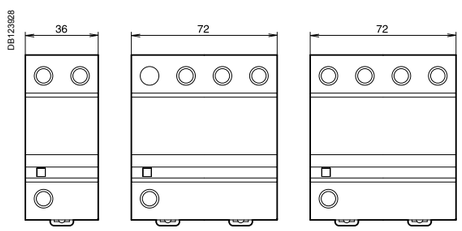
iPRF1 12.5r/PRF1 Master/ PRD1 25r/PRD1 Master

Type 1 and 2 LV surge arresters (cont.)

Dimensions (mm)

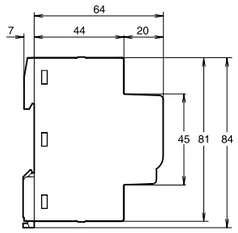


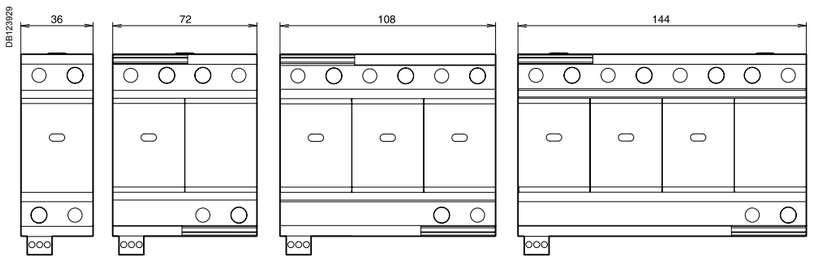
PRF1 Master



1P + N 3P 3P + N

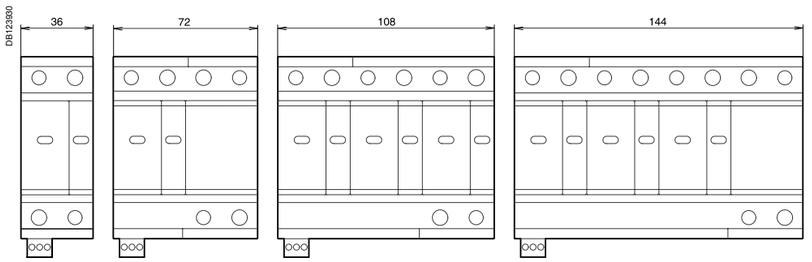
iPRF1 12.5r





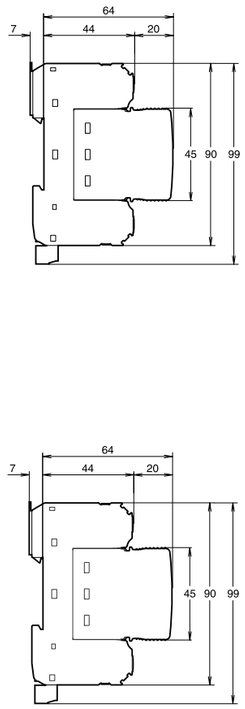
1P 1P + N 3P 3P + N

PRD1 Master



1P 1P + N 3P 3P + N

PRD1 25r



iPRD surge arresters
Type 2 or 3 LV withdrawable surge arresters

iPRD withdrawable surge arresters allow quick replacement of damaged cartridges.


PB105274-35

1P+N


PB105275-35

3P


PB105276-35

3P+N


PB105272-35

Cartridge

Rated discharge current (Imax) / Nominal discharge current (In)	Type of protection		Network						Earthing system	Transfer	Surge arrester name	Width in mod. of 9 mm	Up - (kV) Voltage protection level			Un - (V) Rated voltage network	Uc - (V) Maximum continuous operating voltage		
													CM*		DM*		CM*		DM*
	Incoming	Secondary	1P+N	3P+N	1P	2P	3P	4P					L/⏚	N/⏚	L/N		L/⏚	N/⏚	L/N
65 kA / 20 kA											**iPRD65**								
Very high risk level (strongly exposed site)	iPRD65				**A9L16555**				IT	■	iPRD65r 1P IT	2	⩽ 2	-	-	230	460	-	-
					A9L16556				TT & TN	■	iPRD65r 1P		⩽ 1.5	-	-	-	340	-	-
			A9L16557						TT & TN-S	■	iPRD65r 1P+N	4	-	⩽ 1.5	⩽ 1.5	-	-	260	340
						A9L16442			TN-C	■	iPRD65r 2P		⩽ 1.5	⩽ 1.5	-	-	340	340	-
							A9L16558		IT	■	iPRD65r 3P IT	6	⩽ 2	-	-	230/400	460	-	-
							A9L16443		TN-C	■	iPRD65r 3P		⩽ 1.5	-	-	-	340	-	-
				A9L16559					TT & TN-S	■	iPRD65r 3P+N	8	-	⩽ 1.5	⩽ 1.5	-	-	260	340
								A9L16659	TN-C	■	iPRD65r 4P		⩽ 1.5	⩽ 1.5	-	-	340	340	-
40 kA / 15 kA											**iPRD40**								
High risk level	iPRD40				**A9L16561**				TT & TN	■	iPRD40r 1P	2	⩽ 1.4	-	-	230	340	-	-
					A9L16566				TT & TN		iPRD40 1P		⩽ 1.4	-	-	-	340	-	-
			A9L16562						TT & TN-S	■	iPRD40r 1P+N	4	-	⩽ 1.4	⩽ 1.4	-	-	260	340
			A9L16567						TT & TN-S		iPRD40 1P+N		-	⩽ 1.4	⩽ 1.4	-	-	260	340
						A9L16444			TN-C	■	iPRD40r 2P		⩽ 1.4	⩽ 1.4	-	-	340	340	-
						A9L16667			TN-C		iPRD40 2P		⩽ 1.4	⩽ 1.4	-	-	340	340	-
							A9L16445		TN-C	■	iPRD40r 3P	6	⩽ 1.4	-	-	230/400	340	-	-
							A9L16568		TN-C		iPRD40 3P		⩽ 1.4	-	-	-	340	-	-
							A9L16563		IT	■	iPRD40r 3P IT		⩽ 2	-	-	-	460	-	-
				A9L16564					TT & TN-S	■	iPRD40r 3P+N	8	-	⩽ 1.4	⩽ 1.4	-	-	260	340
				A9L16569					TT & TN-S		iPRD40 3P+N		-	⩽ 1.4	⩽ 1.4	-	-	260	340
								A9L16597	IT	■	iPRD40r 4P IT		⩽ 2	⩽ 2	-	-	460	460	-
								A9L16664	TN-C	■	iPRD40r 4P		⩽ 1.4	⩽ 1.4	-	-	340	340	-
								A9L16669	TN-C		iPRD40 4P		⩽ 1.4	⩽ 1.4	-	-	340	340	-
20 kA / 5 kA											**iPRD20**								
Medium risk level	iPRD20				**A9L16571**				TT & TN		iPRD20 1P	2	⩽ 1.1	-	-	230	340	-	-
			A9L16672						TT & TN-S	■	iPRD20r 1P+N	4	-	⩽ 1.4	⩽ 1.1	-	-	260	340
			A9L16572						TT & TN-S		iPRD20 1P+N		-	⩽ 1.4	⩽ 1.1	-	-	260	340
						A9L16446			TN-C		iPRD20 2P		⩽ 1.1	⩽ 1.1	-	-	340	340	-
							A9L16447		TN-C		iPRD20 3P	6	⩽ 1.1	-	-	230/400	340	-	-
							A9L16573		IT	■	iPRD20r 3P IT		⩽ 1.6	-	-	-	460	-	-
				A9L16674					TT & TN-S	■	iPRD20r 3P+N	8	-	⩽ 1.4	⩽ 1.1	-	-	260	340
				A9L16574					TT & TN-S		iPRD20 3P+N		-	⩽ 1.4	⩽ 1.1	-	-	260	340
								A9L16599	IT	■	iPRD20r 4P IT		⩽ 1.6	⩽ 1.6	-	-	460	460	-
								A9L16673	TN-C		iPRD20 4P		⩽ 1.1	⩽ 1.1	-	-	340	340	-
8 kA / 2.5 kA											**iPRD8 (1)**		**Type 2 / Type 3**						
Secondary protection: placed near the loads to be protected when they are at a distance of more than 30 m from the incoming surge arrester		iPRD8			**A9L16576**				TT & TN		iPRD8 1P	2	⩽ 1 / ⩽ 1	-	-	230	340	-	-
			A9L16677						TT & TN-S	■	iPRD8r 1P+N	4	-	⩽ 1.4 / ⩽ 1	⩽ 1 / ⩽ 1.1	-	-	260	340
			A9L16577						TT & TN-S		iPRD8 1P+N		-	⩽ 1.4 / ⩽ 1	⩽ 1 / ⩽ 1.1	-	-	260	340
						A9L16448			TN-C		iPRD8 2P		⩽ 1 / ⩽ 1	⩽ 1 / ⩽ 1	-	-	340	340	-
							A9L16449		TN-C		iPRD8 3P	6	⩽ 1 / ⩽ 1	-	-	230/400	340	-	-
							A9L16578		IT	■	iPRD8r 3P IT		⩽ 1.4 / ⩽ 1.6	-	-	-	460	-	-
				A9L16679					TT & TN-S	■	iPRD8r 3P+N	8	-	⩽ 1.4 / ⩽ 1	⩽ 1 / ⩽ 1.1	-	-	260	340
				A9L16579					TT & TN-S		iPRD8 3P+N		-	⩽ 1.4 / ⩽ 1	⩽ 1 / ⩽ 1.1	-	-	260	340
								A9L16678	IT	■	iPRD8r 4P IT		⩽ 1.4 / ⩽ 1.6	⩽ 1.4 / ⩽ 1.6	-	-	460	460	-
								A9L16680	TN-C		iPRD8 4P		⩽ 1 / ⩽ 1	⩽ 1 / ⩽ 1	-	-	340	340	-

** **CM**: common mode (phase to earth and neutral to earth). * **DM**: differential mode (phase to neutral). **(1) Uoc**: combinated waveform voltage: 10 kV.*

Spare cartridges

Type	Spare cartridges for	Cat. no
C 65-460	iPRD65r IT	**A9L16682**
C 65-340	iPRD65r	**A9L16681**
C 40-460	iPRD40r IT	**A9L16684**
C 40-340	iPRD40, iPRD40r	**A9L16685**
C 20-460	iPRD20r IT	**A9L16686**
C 20-340	iPRD20, iPRD20r	**A9L16687**
C 8-460	iPRD8r IT	**A9L16688**
C 8-340	iPRD8, iPRD8r	**A9L16689**
C neutral	All products	**A9L16691**

Surge arrester/circuit breaker association

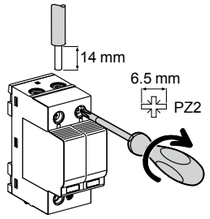
Type of surge arrester	Associated circuit breaker
iPRD65	Curve C 50 A
iPRD40	Curve C 40 A
iPRD20	Curve C 25 A
iPRD8	Curve C 20 A

iPRD surge arresters
Type 2 or 3 LV withdrawable surge arresters (cont.)

iPRD surge arresters
Type 2 or 3 LV withdrawable surge arresters (cont.)

Connection

DB123130



Type	Tightening torque	Copper cables	
		Rigid	Flexible or ferrule
	DB122945	DB122946	
iPRD	2 N.m	2.5 to 25 mm²	2.5 to 16 mm²

Technical data

Main characteristics		
Operating frequency		50/60 Hz
Operating voltage (Ue)		230/400 V AC
Permanent operating current (Ic)		< 1 mA
Response time		< 25 ns
End of life indication: by mechanical indicator	White	In operation
	Red	At end of life
End of life remote indication		By contact NO, NC 250 V / 0.25 A
Additional characteristics		
Operating temperature		-25°C to +60°C
Type of connection terminals		Tunnel terminals, 2.5 to 35 mm²
Standards		IEC 61643-1 T2 and EN 61643-11 Type 2

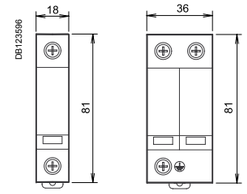
iPRD surge arresters
Type 2 or 3 LV withdrawable surge arresters (cont.)

Weight (g)

Surge arrester	
Type	iPRD
1P	115
2P	220
3P	340
4P	450

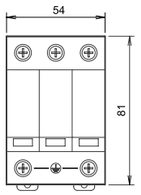
Dimensions (mm)

DB123596

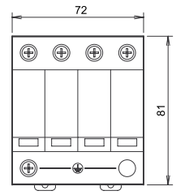


1P

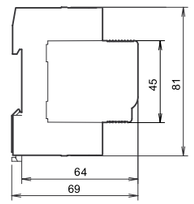
1P+N
2P



3P



3P+N
4P



iPF surge arresters
Type 2 or 3 LV surge arresters

The iPF multi-pole single-piece surge arrester range is adapted for earthing systems: TT, TN-S, TN-C.
Type 2 surge arresters are tested with a 8/20 µs current wave.
Type 3 surge arresters are tested with a 12/50 µs and 8/20 µs combined wave.

Each surge arrester in the range has a specific application:
- **incoming protection (type 2):**
  - the iPF65(r) is recommended for a very high risk level (strongly exposed site)
  - the iPF40(r) is recommended for a high risk level
  - the iPF20 is recommended for a medium risk level
- **secondary protection (type 2 or 3):**
  - the iPF8 ensures secondary protection of loads to be protected and is placed in cascade with the incoming surge arresters. This surge arrester is required when the loads to be protected are at a distance of more than 30 m from the incoming surge arrester.

The iPF surge arresters with “r” indication have remote transfer of the information: “surge arrester to be replaced”.

1P+N.

3P+N.

Rated discharge current (Imax) / Nominal discharge current (In)	Type of protection		Network						Earthing system	Transfer	Surge arrester name	Width in mod. of 9 mm	Up - (kV) Voltage protection level			Un - (V) Rated voltage network	Uc - (V) Maximum continuous operating voltage		
													CM*		DM*		CM*		DM*
	Incoming	Secondary (type 2 or 3)	1P+N	3P+N	1P	2P	3P	4P					L/⏚	N/⏚	L/N		L/⏚	N/⏚	L/N
65 kA / 20 kA											**iPF65**								
	iPF65				**A9L15683**				TT & TN		iPF65 1P	2	⩽ 1.5	-	-	230	340	-	-
			A9L15684						TT & TN-S		iPF65 1P+N	4	-	⩽ 1.5	⩽ 1.5		-	260	340
						A9L15584			TN-C		iPF65 2P		⩽ 1.5	⩽ 1.5	-		340	340	-
							A9L15581		TN-C		iPF65 3P	8	⩽ 1.5	-	-	230/400	340	-	-
				A9L15685					TT & TN-S	■	iPF65r 3P+N		-	⩽ 1.5	⩽ 1.5		-	260	340
				A9L15586					TT & TN-S		iPF65 3P+N		-	⩽ 1.5	⩽ 1.5		-	260	340
								A9L15585	TN-C	■	iPF65r 4P		⩽ 1.5	⩽ 1.5	-		340	340	-
40 kA / 15 kA											**iPF40**								
High risk level	iPF40				**A9L15686**				TT & TN		iPF40 1P	2	⩽ 1.5	-	-	230	340	-	-
			A9L15687						TT & TN-S		iPF40 1P+N	4	-	⩽ 1.5	⩽ 1.5		-	260	340
						A9L15587			TN-C		iPF40 2P		⩽ 1.5	⩽ 1.5	-		340	340	-
							A9L15582		TN-C		iPF40 3P	8	⩽ 1.5	-	-	230/400	340	-	-
				A9L15690					TT & TN-S	■	iPF40r 3P+N		-	⩽ 1.5	⩽ 1.5		-	260	340
				A9L15688					TT & TN-S		iPF40 3P+N		-	⩽ 1.5	⩽ 1.5		-	260	340
								A9L15590	TN-C	■	iPF40r 4P		⩽ 1.5	⩽ 1.5	-		340	340	-
								A9L15588	TN-C		iPF40 4P		⩽ 1.5	⩽ 1.5	-		340	340	-
20 kA / 5 kA											**iPF20**								
Medium risk level	iPF20				**A9L15691**				TT & TN		iPF20 1P	2	⩽ 1.1	-	-	230	340	-	-
			A9L15692						TT & TN-S		iPF20 1P+N	4	-	⩽ 1.5	⩽ 1.1		-	260	340
						A9L15592			TN-C		iPF20 2P		⩽ 1.1	⩽ 1.1	-		340	340	-
							A9L15597		TN-C		iPF20 3P	8	⩽ 1.1	-	-	230/400	340	-	-
				A9L15693					TT & TN-S		iPF20 3P+N		-	⩽ 1.5	⩽ 1.1		-	260	340
								A9L15593	TN-C		iPF20 4P		⩽ 1.1	⩽ 1.1	-		340	340	-
8 kA / 2.5 kA											**iPF8 (1)**		**Type 2 / Type 3**						
Secondary protection: placed near the loads to be protected when they are at a distance of more than 30 m from the incoming surge arrester		iPF8			**A9L15694**				TT & TN		iPF8 1P	2	⩽ 1 / ⩽ 1.1	-	-	230	340	-	-
			A9L15695						TT & TN-S		iPF8 1P+N	4	-	⩽ 1.5 / ⩽ 1.2	⩽ 1 / ⩽ 1.1		-	260	340
						A9L15595			TN-C		iPF8 2P		⩽ 1 / ⩽ 1.1	⩽ 1 / ⩽ 1.1	-		340	340	-
							A9L15598		TN-C		iPF8 3P	8	⩽ 1 / ⩽ 1.1	-	-	230/400	340	-	-
				A9L15696					TT & TN-S		iPF8 3P+N		-	⩽ 1.5 / ⩽ 1.2	⩽ 1 / ⩽ 1.1		-	260	340
								A9L15596	TN-C		iPF8 4P		⩽ 1 / ⩽ 1.1	⩽ 1 / ⩽ 1.1	-		340	340	-

** **CM**: common mode (phase to earth and neutral to earth). * **DM**: differential mode (phase to neutral). **(1) Uoc**: combinated waveform voltage: 10 kV.*

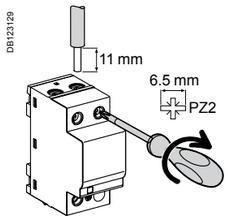
Surge arrester/circuit breaker association	
Type of surge arrester	**Associated circuit breaker**
iPF65	Curve C 50 A
iPF40	Curve C 40 A
iPF20	Curve C 25 A
iPF8	Curve C 20 A

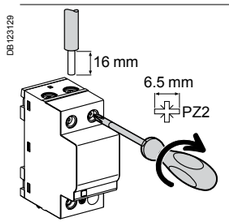
Protection
Load protection

iPF surge arresters
Type 2 or 3 LV surge arresters (cont.)

iPF surge arresters
Type 2 or 3 LV surge arresters (cont.)

Connection





Type		Tightening torque	Copper cables	
			Rigid	Flexible or ferrule
		DB122945	DB122946	
iPF8 / 20	Ph / N	1.2 N.m	16 mm² max.	10 mm² max.
	⏚	2 N.m	25 mm² max.	16 mm² max.
iPF40 / 65	Ph / N	2 N.m	25 mm² max.	16 mm² max.
	⏚	3.5 N.m	50 mm² max.	35 mm² max.

Technical data

Main characteristics		
Operating frequency		50/60 Hz
Operating voltage (Ue)		230/400 V AC
Permanent operating current (Ic)		< 1 mA
Response time		< 25 ns
End of life indication: by green/red mechanical indicator	Green	In operation
	Red	At end of life
End of life remote indication		By contact NO, NC 250 V / 0.25 A
Additional characteristics		
Operating temperature		-25°C to +60°C
Type of connection terminals		Tunnel terminals, 2.5 to 35 mm²
Standards		IEC 61643-1 T2 and EN 61643-11 Type 2

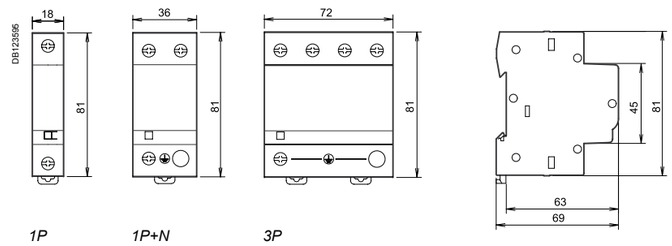
Protection
Load protection

iPF surge arresters
Type 2 or 3 LV surge arresters (cont.)

Weight (g)

Surge arrester	
Type	iPF
1P	125
2P	210
3P	335
4P	420

Dimensions (mm)



1P *1P+N* *2P* *3P* *3P+N* *4P*

iPRC, iPRI surge arresters

Country approval pictograms

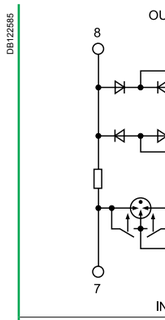
Protection against overvoltages related to lightning strikes.

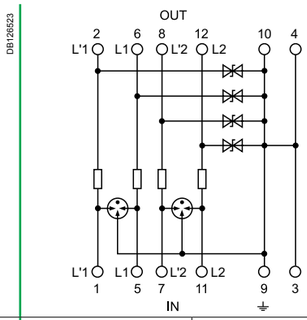
A9L16337

A9L16339

Analogue telephone line protection: the iPRC surge arrester wired in series to the private installation input protects the telephones, the PABX, the modems (including ADSL), etc.

Protection for 2 low-current lines without common potential or 4 lines with common reference potential: the iPRI protects the measuring instrument and PLC "sensor" inputs and the DC power supply inputs up to 53 V and AC power supply inputs up to 37 V.
The input current must not exceed 300 mA.



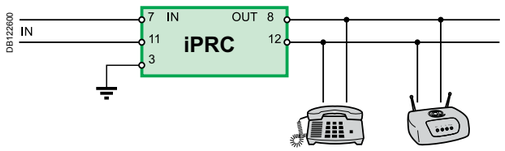


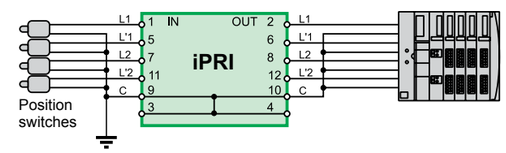
Line L1	Cables 7-8	**Line L1**	Cables 5-6
Line L2	Cables 11-12	**Line L2**	Cables 11-12
–	–	**Line L'1**	Cables 1-2
–	–	**Line L'2**	Cables 7-8
⏚	Cable 3	⏚	Cables 3-4-9-10
IN	Ligne side	**IN**	Ligne side
OUT	Protected side	**OUT**	Protected side

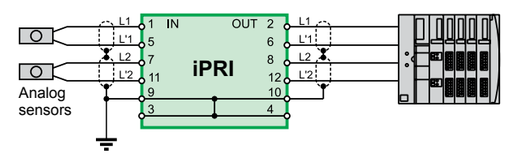
Catalogue numbers

Surge arresters	iPRC	iPRI
Mains voltage (Un)	**<130 V AC**	**48 V DC**
Analogue telephone system	■	–
Telephone transmitter	■	–
Digital telephone system	–	■
Automation network	–	■
VLV load power supply (12…48 V)	–	■
xDSL compatibility	■	–
Cat. no..	**A9L16337**	**A9L16339**
Width in 9 mm modules	2	2

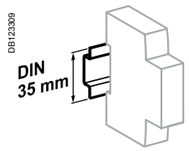
Diagrams



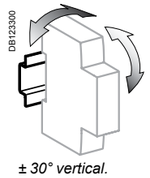




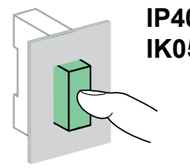
iPRC, iPRI surge arresters (cont.)



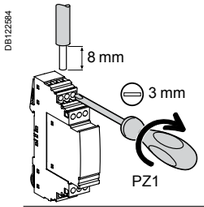
Clip on DIN rail 35 mm.



± 30° vertical.



Connection



Tightening torque	Copper cables	
	Rigid	Flexible or ferrule
		
0.8 N.m	0.2 to 4 mm²	0.2 to 2,5 mm²

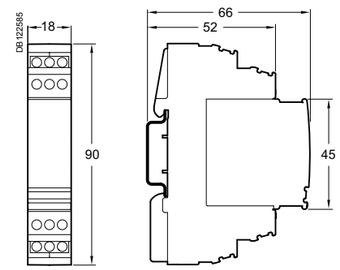
Technical data

Main characteristics		iPRC	iPRI
Number of protected lines		2	2
Test category	IEC/VDE	C1, C2, C3, D1, B2	C1, C2, C3, D1, B2
Maximum continuous voltage (Uc)		180 V DC, 130 V AC	53 V DC, 37 V AC
Limitation voltage (Up)		300 V	70 V
Rated discharge current (8/20) (In)		10 kA	10 kA
Maximum discharge current (8/20) (Imax)		18 kA	10 kA
Response time		< 500 ns	≤ 1 ns
Nominal impulse current		100 A	70 A
Rated current (I_N)		450 mA (up to 45°C)	300 mA (up to 45°C)
Series resistor		2.2 Ω	4.7 Ω
End-of-life information by		Loss of dialling tone	Loss of transmission
Additional characteristics			
Degree of protection	Device only	IP20	IP20
	Device in modular enclosure	IP40	IP40
	IK	05	05
Operating temperature		-25°C to +60°C	-25°C to +60°C
Storage temperature		-40°C to +85°C	-40°C to +85°C

Weight (g)

Surge arresters		
Type	**iPRC**	**iPRI**
	25	65

Dimensions (mm)



iPRD-DC surge arresters
Withdrawable surge arresters type 2 for photovoltaic applications

Country approval pictograms

IEC 61643-1 T2
EN 61643-11 Type 2
UTE C 61740-51 T2
prEN 50539-11 T2

PB107586-40

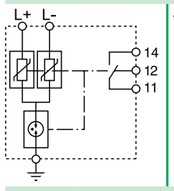
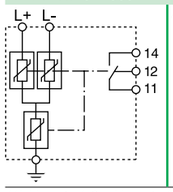
iPRD-DC40r 600PV

iPRD-DC direct current surge arresters are designed to protect against overvoltages due to a lightning strike: of the "DC" input to the inverter and of photovoltaic panels.

It should be installed in a switchboard inside the building. If the switchboard is located outside, it must be weatherproof.

Withdrawable iPRD-DC surge arresters allow damaged cartridges to be replaced quickly.
They offer remote reporting of the "cartridge must be changed" message.

Catalogue numbers

Internal diagram	Imax (kA) Maximum discharge current	In (kA) Nominal discharge current	Up (kV) Protection level			U_{CPV} (V) (1) Maximum steady state voltage			Width in module of 9 mm	Cat. no.
			L+/⏚	L-/⏚	L+/L-	L+/⏚	L-/⏚	L+/L-		
iPRD-DC40r 600PV										
DB124051 	40	15	1.6	1.6	2.8	600	600	840	6	**A9L16434**
iPRD-DC40r 1000PV										
DB124052 	40	15	3.9	3.9	3.9	1000	1000	1000	6	**A9L16436**

(1) Ucpv ⩾ 1.2 x Uoc stc (Uoc stc: maximum no-load voltage of the photovoltaic generator "photovoltaic module manufacturer's data")

PB107586-30

PB107587-30

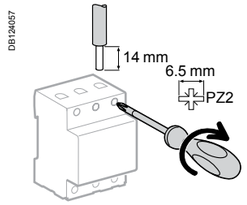
Replacement cartridges

Replacement cartridges		
Type	**Replacement cartridges for**	**Cat. no.**
C 40-600PV	iPRD-DC40r 600PV	**A9L16683**
C 40-1000PV	iPRD-DC40r 1000PV	**A9L16692**
C neutral PV	iPRD-DC40r 600PV	**A9L16690**

iPRD-DC surge arresters
Withdrawable surge arresters type 2 for photovoltaic applications (cont.)

Connection

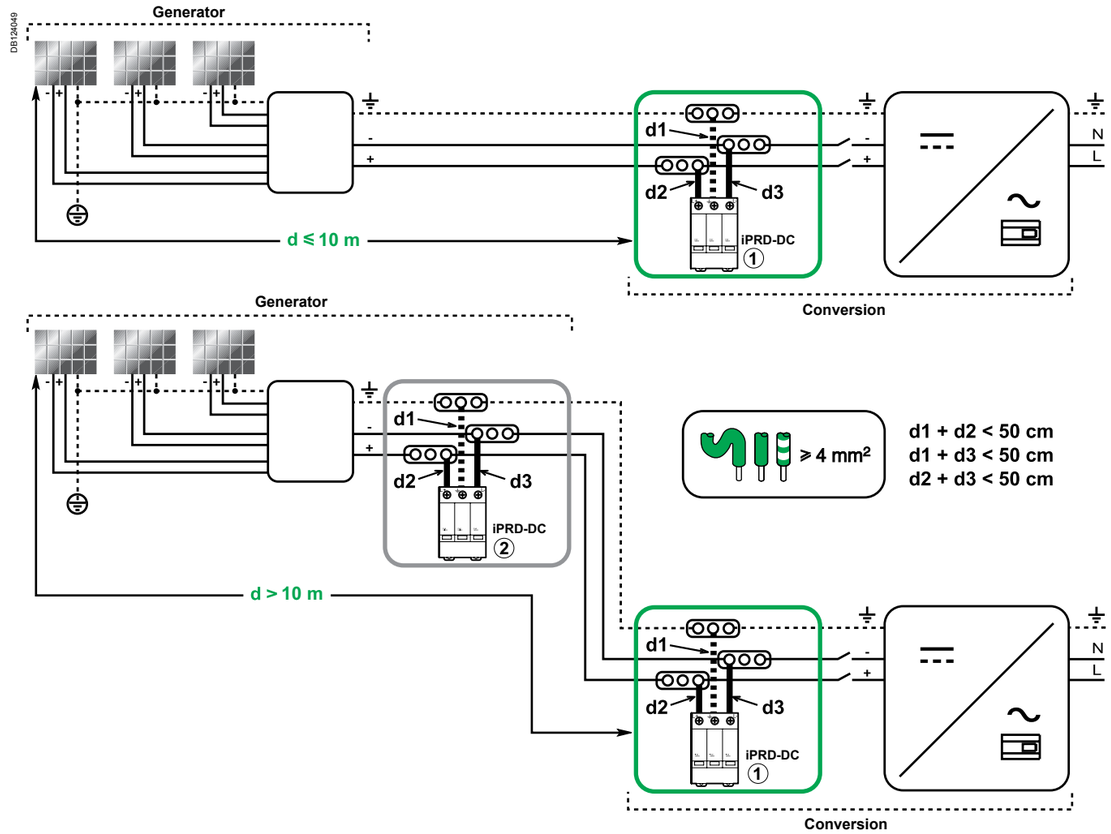
DB124057



Type	Tightening torque	Copper cables	
		Rigid	Flexible or ferrule
	DB122945	DB122946	
iPRD-DC	2 N.m	2.5 to 25 mm²	2.5 to 16 mm²

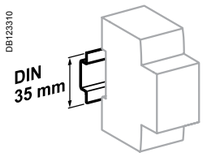
Depending on the distance between the "generator" part and the "conversion" part, it may be necessary to install two surge arresters or more, to ensure protection of each of the two parts.

DB124049

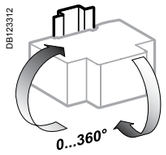


iPRD-DC surge arresters

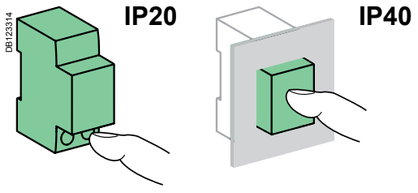
Withdrawable surge arresters type 2 for photovoltaic applications (cont.)



Clip on DIN rail 35 mm.



Indifferent position of installation.



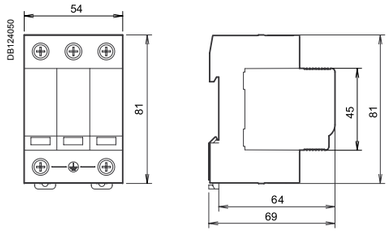
Technical data

Main characteristics			
Type of network		Isolated direct current	
Temps de réponse		< 25 ns	
Short circuit current (I_{SCPV})		30 A	
Type of surge arresters		Type 2	
End-of-life indication mode		Circuit opened by integrated thermal disconnector	
Additional characteristics			
Degree of protection (IEC 60529)	Device only	IP20	
	Device in modular enclosure	IP40	
	Chocs	IK03	
End-of-life indication	By the cartridges	White	Operational
		Red	At end of life
	By the NO/NC remote indication contact 250 V AC / 0.25 A		
Operating temperature		-25°C to +60°C	
Storage temperature		-40°C to +85°C	
Tropicalization (IEC 60068-1)		Treatment 2 (relative humidity of 95 % at 55°C)	

Weight (g)

Surge arresters	
Type	
iPRD-DC40r 600PV	400
iPRD-DC40r 1000PV	400

Dimensions (mm)



Photovoltaic

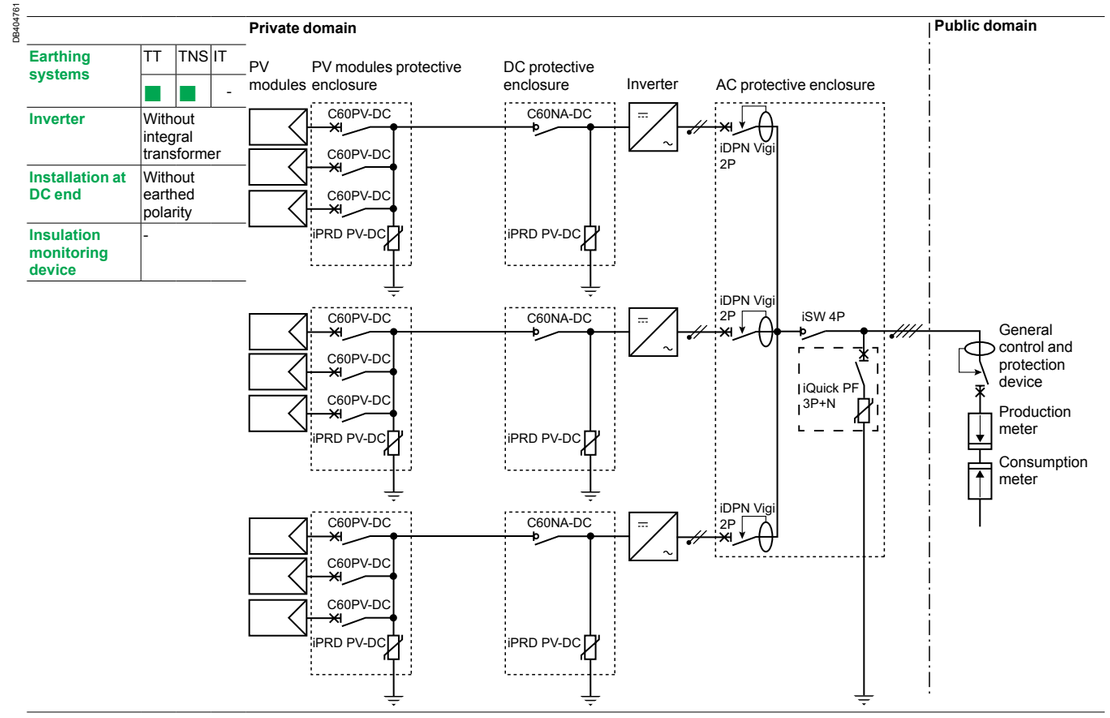
Examples of installation architectures

The examples of photovoltaic installation architectures presented in this document illustrate the use of direct current circuit breakers dedicated to protection of the modules and cables of the PV strings, to protect against overloads and short circuits. To ensure the safety of the photovoltaic installation it is necessary, in the cases described below, to combine the C60PV-DC circuit breaker with other protective or fault detection devices on the DC side.

Installation from 10 to 100 kW - Ue ⩽ 800 V DC

In the case of a **PV architecture without an earthed polarity on the DC side and with a PV inverter without galvanic isolation**, it is necessary to:
- protect each string of photovoltaic modules with a C60PV-DC installed in the junction box near the PV modules
- add a residual current device on the AC side of the PV inverter so that the latter trips as soon as an earth fault occurs on the DC side.

It is necessary to intervene immediatly on the site at the first default.
Restarting will be possible only after eliminating the fault.



Photovoltaic (cont.)
Examples of installation architectures

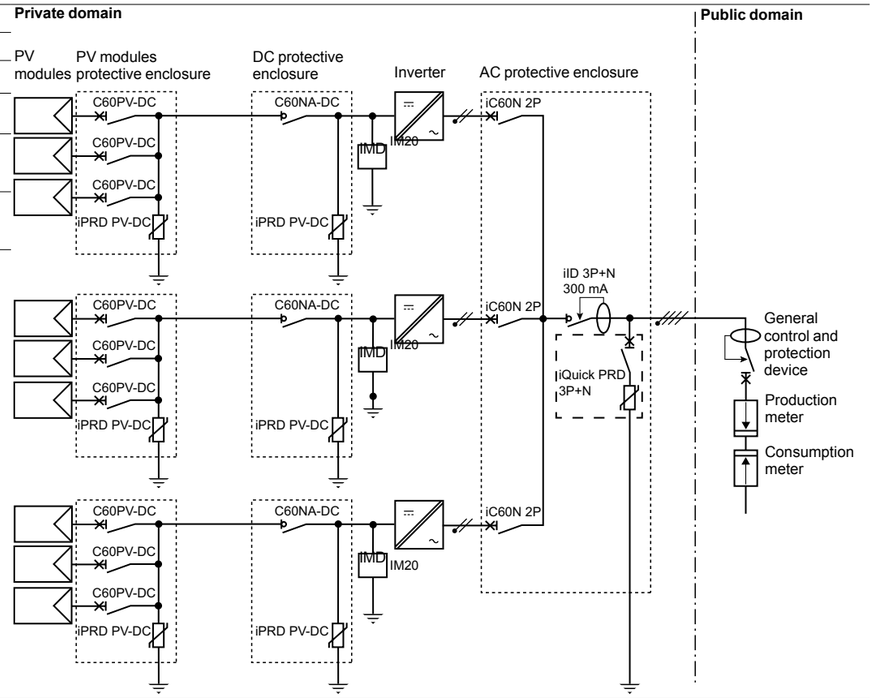
Installation from 10 to 100 kW - Ue ⩽ 800 V DC

In the case of a **PV architecture without an earthed polarity on the DC side and with a PV inverter or with galvanic isolation**, it is necessary to:
- protect each string of photovoltaic modules with a C60PV-DC installed in the junction box near the PV modules;
- add an insulation monitoring device on the DC side of the PV inverter in order to indicate a first earth fault and actuate stoppage of the inverter as soon as it occurs.

It is necessary to intervene immediatly on the site at the first default.
Restarting will be possible only after eliminating the fault.

DB404762

Earthing systems	TT	TNS	IT
	■	■	-
Inverter	With integral transformer		
Installation at DC end	Without earthed polarity		
Insulation monitoring device	■		



Photovoltaic (cont.)
Examples of installation architectures

Installation from 10 to 100 kW - Ue ⩽ 800 V DC

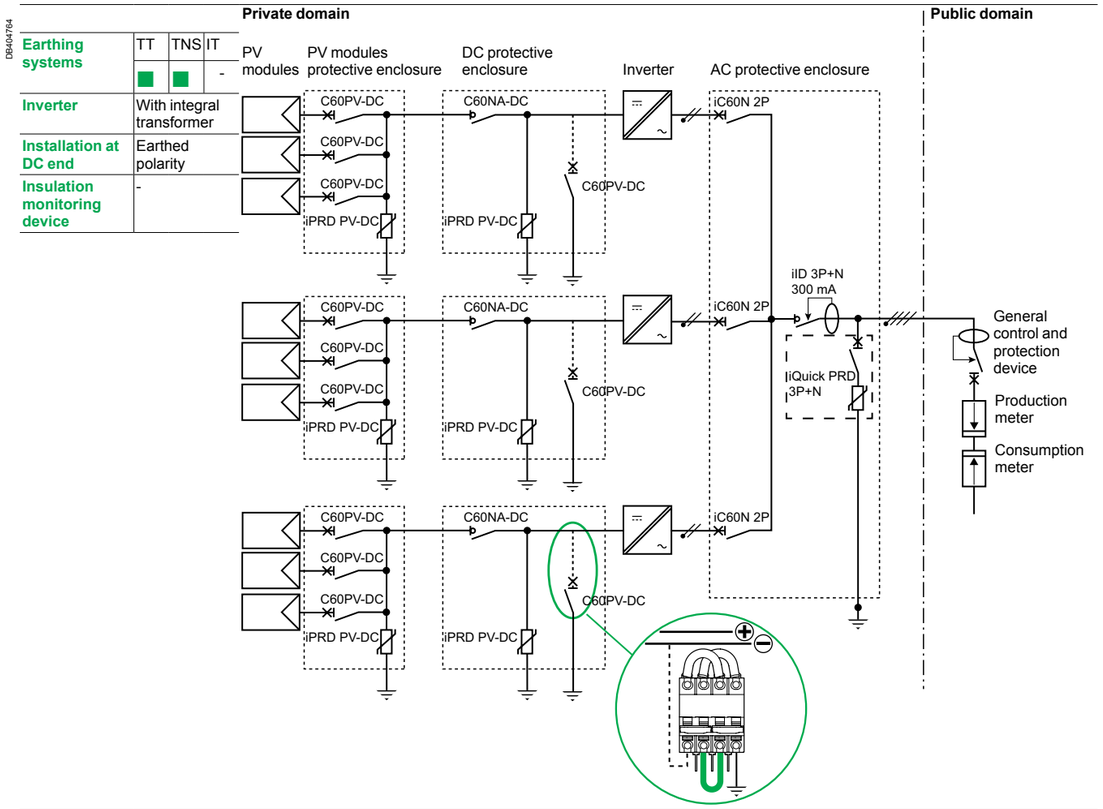
In the case of a **PV architecture with an earthed polarity on the DC side and with a PV inverter having galvanic isolation**, it is necessary to:
- protect each string of photovoltaic modules with a C60PV-DC installed in the junction box near the PV modules
- add a C60PV-DC earth protection circuit breaker, with all poles in series, on the DC side of the PV inverter.

PV inverter stoppage is actuated via an auxiliary contact combined with the earth protection circuit breaker. Polarity earthing and the protective device should not be implemented if the PV inverter already has an earthed polarity.

It is necessary to intervene immediatly on the site at the first default.
Restarting will be possible only after eliminating the fault.

DB404764

Earthing systems	TT	TNS	IT
	■	■	-
Inverter	With integral transformer		
Installation at DC end	Earthed polarity		
Insulation monitoring device	-		



Photovoltaic (cont.)
Examples of installation architectures

Installation > 100 kW - Ue ⩽ 800 V DC

In the case of a **PV architecture without an earthed polarity on the DC side and a central PV inverter having galvanic isolation**, it is necessary to:
- protect each string of photovoltaic modules with a C60PV-DC installed in the protection cabinet for the PV strings located near the PV modules
- add an insulation monitoring device (IMD) on the DC side of the PV inverter (and on the AC side if IT earthing system on AC side) in order to indicate a first earth fault and actuate stoppage of the PV inverter as soon as it occurs.

It is necessary to intervene immediatly on the site at the first default.
Restarting will be possible only after eliminating the fault.

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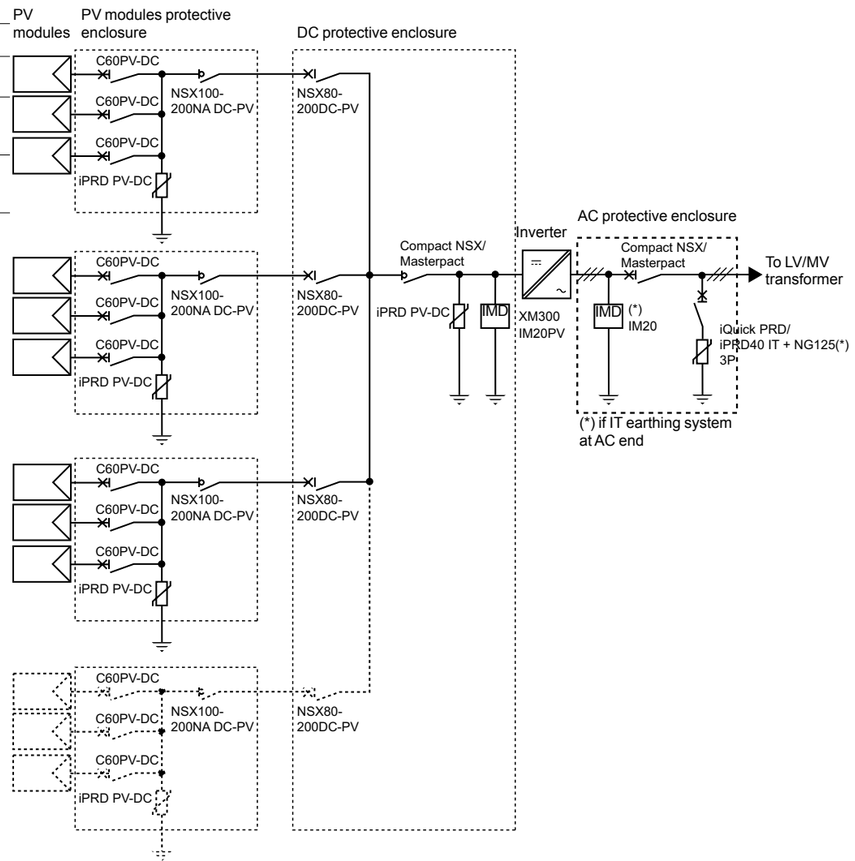
Earthing systems	TT	TNS	IT
	■	■	■
Inverter	With integral transformer		
Installation at DC end	Without earthed polarity		
Insulation monitoring device	■		



Photovoltaic (cont.)
Examples of installation architectures

Installations > 100 kW - Ue ⩽ 800 V DC

In the case of a **PV architecture with an earthed polarity on the DC side and a central inverter having galvanic isolation and an IT earthing system on the AC side**, it is necessary to:
- protect each string of photovoltaic modules with a C60PV-DC installed in the protection cabinet for the PV strings located near the PV modules
- add a C60PV-DC earth protection circuit breaker, with all poles in series, on the DC side of the PV inverter.

PV inverter stoppage is actuated via an auxiliary contact combined with the earth protection circuit breaker. Polarity earthing and the protective device should not be implemented if the PV inverter already has an earthed polarity.
If the Isc of the DC installation exceeds 1.5 kA, replace the C60PV-DC earth protection circuit breaker with an NSX80 DC PV provided with a 16 A release.

It is necessary to intervene immediatly on the site at the first default.
Restarting will be possible only after eliminating the fault.

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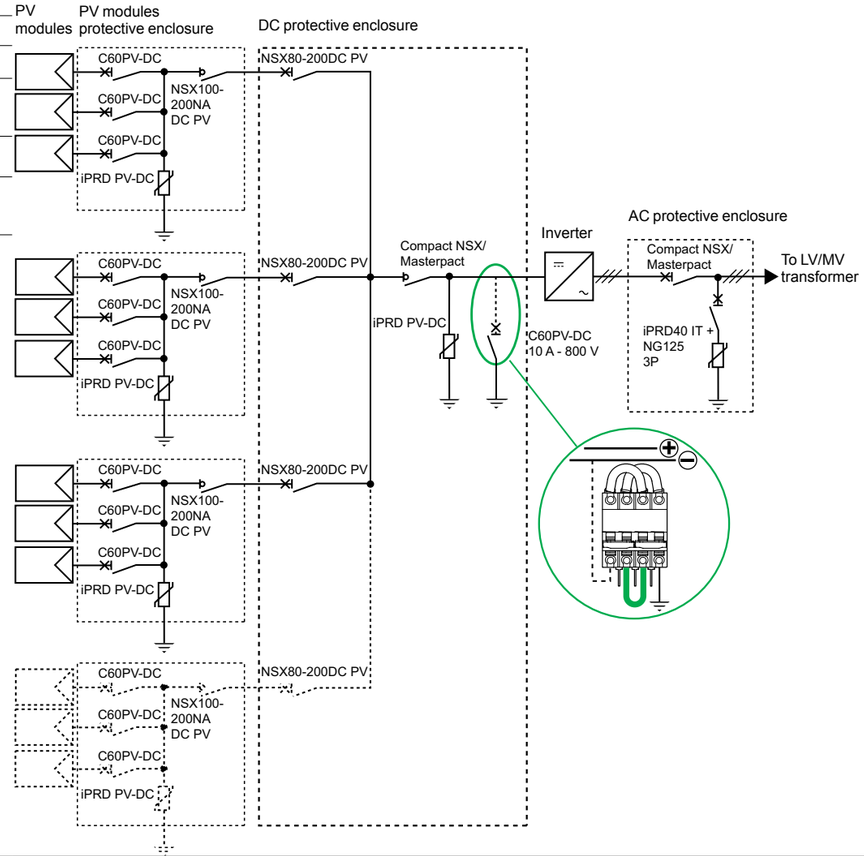
Earthing systems	TT	TNS	IT
	-	-	■
Inverter	Without integral transformer		
Installation at DC end	Earthed polarity		
Insulation monitoring device	-		



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