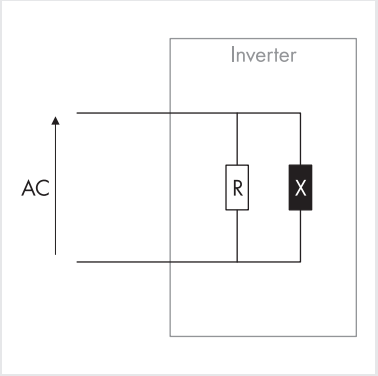
Impedance at 175 Hz for PV Systems in France

SUNNY BOY/SUNNY MINI CENTRAL/SUNNY TRIPOWER/ FLX PRO

For the tariff adjustment, the French grid operator ERDF uses a ripple control signal with a frequency of 175 Hz in its utility grid.

In order to assess the compatibility with the ripple control signal, ERDF requires the impedances of the generators feeding in.

To carry out the assessment, SMA Solar Technology AG determined the impedances (R, X, |Z|) for its inverters at a frequency of 175 Hz. The following table lists the values for the different inverters.

Inverter device type	Series connection			Inverter output voltage
				
	X	R	|Z|	
SB				
SB 1200 / SB 1700	-193	0.2	193	230 V
SB 1300TL-10/SB 1600TL-10	-111	0.2	111	230 V
SB 2100TL	-187	0.2	187	230 V
SB 2500	-118	0.2	118	230 V
SB 3000	-105	0.2	105	230 V
SB 2500TLST-21/SB 3000TLST-21	-174	0.2	174	230 V
SB 2000HF-30/SB 2500HF-30/SB 3000HF-30	-218	0.2	218.1	230 V
SB 3000TL-21/SB 3600TL-21/SB 4000TL-21/ SB 5000TL-21	-174	0.2	174	230 V
SB 3300/SB 3800	-90	0.2	90	230 V
SMC				
SMC 4600A/SMC 5000A/SMC 6000A	-64	0.2	65	230 V
SMC 6000TL/SMC 7000TL/SMC 8000TL	-66	0.2	66	230 V
SMC 7000HV/SMC 7000HV-11	-49	0.2	49	230 V
SMC 9000TL-10/SMC 10000TL-10/ SMC 11000TL-10	-47	0.2	47	230 V
SMC 9000TLRP-10/SMC 10000TLRP-10/ SMC 11000TLRP-10	-47	0.2	47	230 V
STP				

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	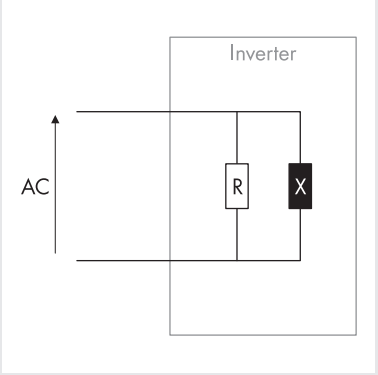			
	X	**R**	**|Z|**	
STP 5000TL-20/STP 6000TL-20/ STP 7000TL-20/ STP 8000TL-20/ STP 9000TL-20/ STP 10000TL-20/ STP 12000TL-20	-86	0.2	86	3 x 400 V
STP 8000TL-10/STP 10000TL-10/ STP 12000TL-10	-82	0.2	82	3 x 400 V
STP 15000TL-10/STP 17000TL-10	-73	0.2	73	3 x 400 V
STP 15000TLEE-10/STP 20000TLEE-10	-73	0.2	73	3 x 400 V
STP 15000TL-30/STP 20000TL-30	-84	0.2	94	3 x 400 V
STP 25000TL-30	-76	0.2	76	3 x 400 V
STP 60-10	-1.02	1.92	2.17	3 x 400 V
FLX PRO				
FLX PRO 15	-4.20	5.13	6.64	3 x 400 V
FLX PRO 17	-3.71	4.67	5.96	3 x 400 V