



Compatibility of SMA Inverters with PID Solutions

In order to recover PID³ effects in PV modules, it may make sense to implement a technical solution that applies a high direct voltage to the PV module at night when there is no solar irradiation. Below, a distinction is made between PID solutions with and without a switching function.

a) PID Solution without Switching Function

A PID solution without switching function is a PID solution that applies direct voltage to the PV array at night without disconnecting the inverter. This results in operating conditions for the PV inverters that differ from operation without such PID solutions.

SMA has gained extensive experience in the field regarding such PID solutions in the past. It was observed that these operating conditions accelerated rare failure mechanisms in a very small number of exceptional cases. This results in particular from the application of the high direct voltage at night.

SMA has continually improved the construction and qualification of newer PV inverter types in order to minimize the risk of failure in case of the use of external PID solutions. In older devices, however, there is still a risk of failure. This is why SMA only recommends use in conjunction with such a PID solution without switching function for the following inverter types:

SUNNY BOY	SUNNY TRIPOWER	
SB 3000TL-21 ¹	STP 5000TL-20 ²	STP 8000TL-10
SB 3600TL-21 ¹	STP 6000TL-20 ²	STP 10000TL-10
SB 4000TL-21 ¹	STP 7000TL-20 ²	STP 12000TL-10
SB 5000TL-21 ¹	STP 8000TL-20 ²	STP 15000TL-10
SB 6000TL-21 ¹	STP 9000TL-20 ²	STP 17000TL-10
SB 3500TL-JP-22	STP 10000TL-20	STP 20000TL-30
SB 4500TL-JP-22	STP 12000TL-20	STP 25000TL-30

¹ From production date 2014-02-03, ² From production date 2014-02-10, ³ PID: Potential Induced Degradation

For these inverter types, an existing SMA factory warranty remains unchanged in this case under the currently valid warranty conditions. SMA is unable to make similar comments on other SMA inverters that are not included in this list because no appropriate positive test results are available.

b) PID Solution with Switching Function

A PID solution with switching function disconnects the PV array from the inverter at night before it applies voltage. As a result, the inverter is not subjected to a high input voltage for a longer period. We estimate that this solution would avoid any increase in the probability that the inverter will fail and therefore is also an option for the following SMA inverter types depending on the application:

SUNNY MINI CENTRAL	SUNNY BOY	SUNNY TRIPOWER
SMC 6000TL	SB 3000TL-20	STP 15000TLHE-10
SMC 7000TL	SB 3600TL-20	STP 20000TLHE-10
SMC 8000TL	SB 4000TL-20	STP 15000TLEE-10
SMC 9000TL-10	SB 5000TL-20	STP 20000TLEE-10
SMC 10000TL-10		
SMC 11000TL-10		
SMC 9000TLRP-10		
SMC 10000TLRP-10		
SMC 11000TLRP-10		

For these inverter types, an existing SMA factory warranty remains unchanged in this case under the currently valid warranty conditions. SMA is unable to make similar comments on other SMA inverters that are not included in this list because no appropriate positive test results are available.

c) No Statement regarding the General Compatibility

However, for the final evaluation of the compatibility of the system with a PID solution as such, it still would be necessary to prove that the PID solution does not interfere with the operation of the system. This proof cannot be provided by SMA, but would have to be provided by the manufacturer of the PID solution.

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