

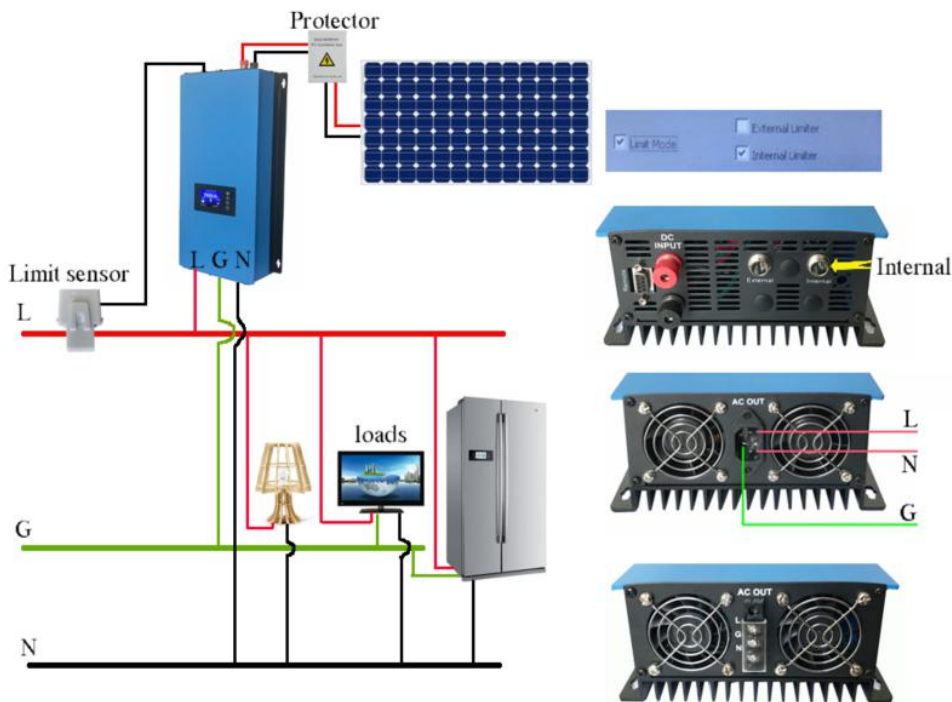
Limit Function User Manual

Why our grid tie inverters need limit function? --- It is in response to the overwhelming clamor from our customers for a function that can control the amount of power that the grid tie inverters can generate. With this function, the inverters will just generate power that is not larger than the loads' power even the inverters are connected with big power solar panel array, we call it "limit function".

Because in some countries, the producer pays for the excess power it gives to the distribution grid. This is because the electric power meter (the one provided by the electricity provider in the area) is not aware of the direction of power flow. In other words it only adds even if power is exported to the grid, thus, the consumer will be charged for power even if it is given to the grid, and this is the problem.

Our SUN G2 series grid tie inverters are integrated this limit function, so SUN G2 series inverters can work in limit mode or normal mode (no limit), you can make the configuration on the LCD display.

Connecting method for single phase AC grid

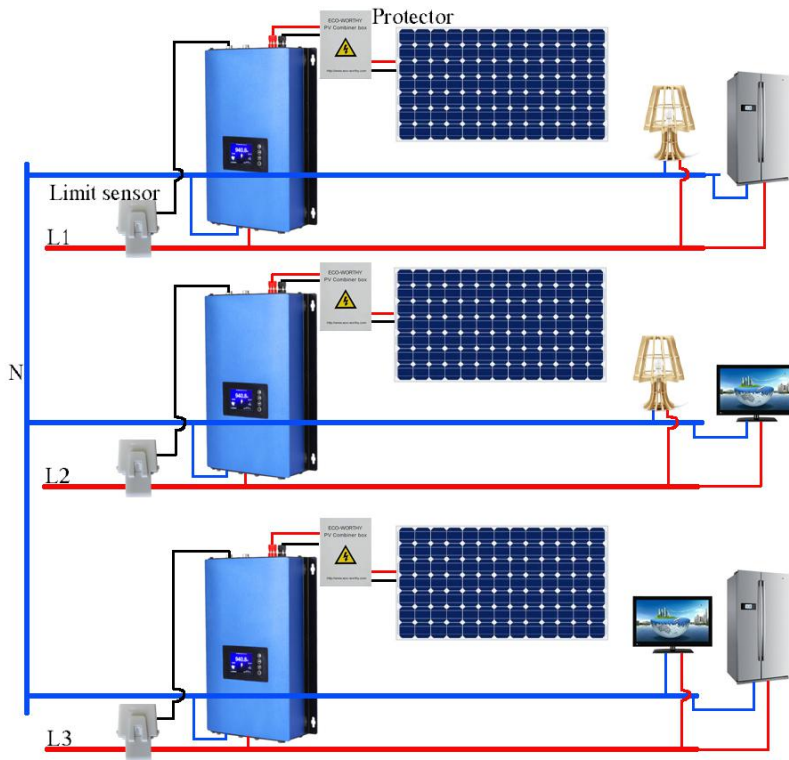


Picture 1: Connecting method for single phase AC grid.

The limit sensor should be clamped on the live line at the position before the loads' access points, and the inverter's access point can be at any position on the same live line, see picture 1. The inverter with the limit function will just generate power that is less than total power consumption by loads that are connected after the position that the limit sensor clamped. The inverter will not measure loads' power that connected before the point of the limit sensor clamped.

Connecting method for three phases AC grid

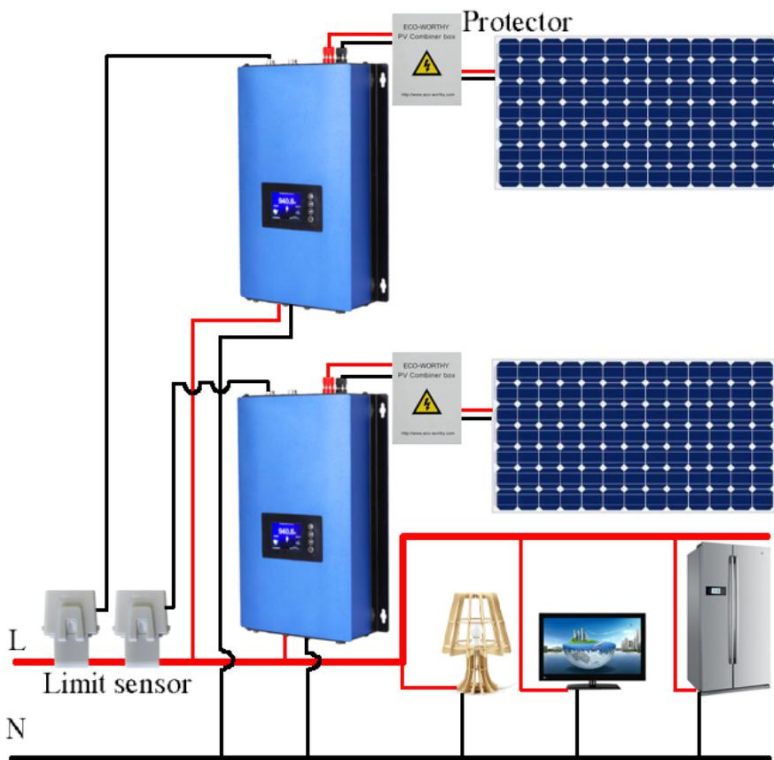
If your AC grid is three phases grid, and you have more SUN G2 grid tie inverters, then you can connect inverters to three phases individually. Please see picture 2. These three inverters will not affect each other. G line will be connected as normal, so not shown in picture 2.



Picture 2: Connecting three inverters at three phases individually

Connecting more than one inverter on one live line:

If you want to use more inverters on one live line to generate more power and also need limit function, you can connect inverters like picture 3 (for two inverters). The two inverters will not produce the same power, but limit function is still available. G line will be connected as normal, so not shown in picture 3.



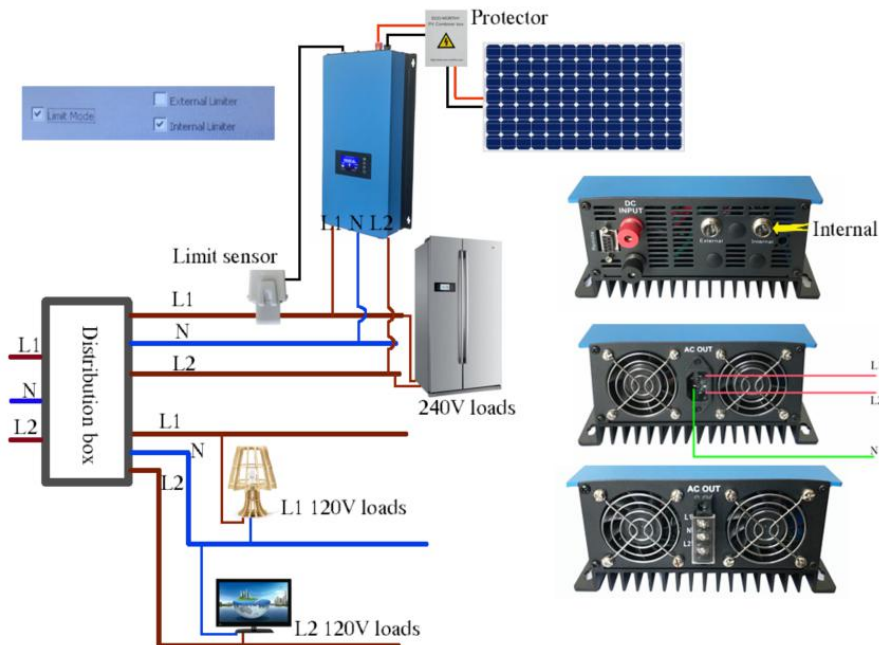
Picture 3: Connecting two inverters on one live line.

Limit function for the US split phase AC grid.

First connecting method for SUN-2000G2(Suggested)

The inverter should be connected to compensate for 240V loads. Because the inverter will generate the same value feed current at L1 and L2, and 240V loads also consume the same value current at L1 and L2, so with the limit function of the inverter, the inverter will just produce power that is same as or less than 240V loads' power, there will be no extra countercurrent feeding to the AC grid.

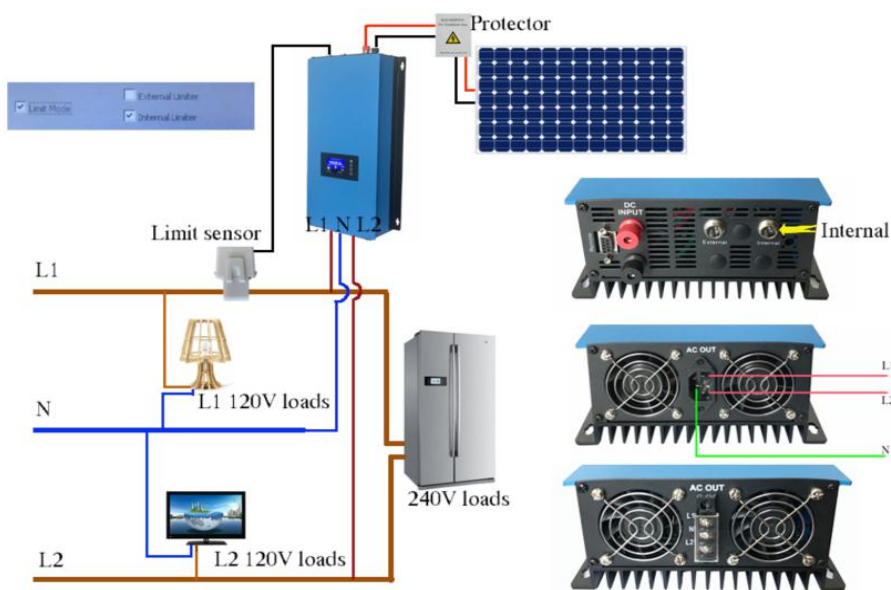
So if the 240V loads were connected at separate lines and not mixed with 120V loads, you can connect the inverter and clamp the limit sensor as picture4.



Picture 4: Connecting method for Compensating 240V loads' power at a separate live line

Second connecting method for SUN-2000G2(Suggested)

If 240V loads and 120V loads were connected on the same live lines, but 240V loads were connected after 120V loads, the best connecting method is clamping the limit sensor on the live line at the position after the 120V loads and before 240V loads. The inverter can be connected at any position on the live lines, See picture 5.



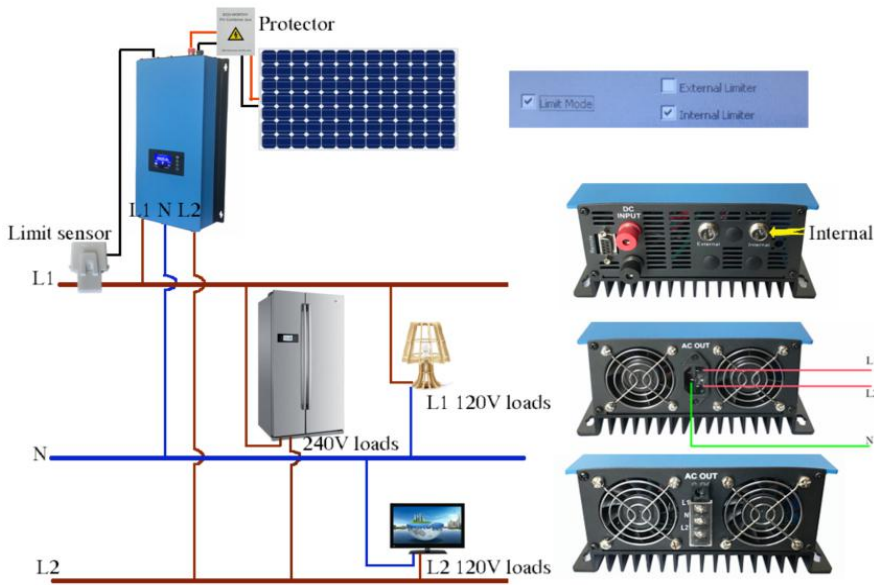
Picture 5: Connecting method for Compensating 240V loads

Because the inverter will produce the same value feed current at L1 and L2, and 240V loads also consume the same value current at L1 and L2, so with the limit function of the inverter, the inverter will just produce power that is same as

or less than 240V loads' power, there will be no extra countercurrent feeding to the AC grid.

Third connecting method for SUN-2000G2(Can be used, but not suggested)

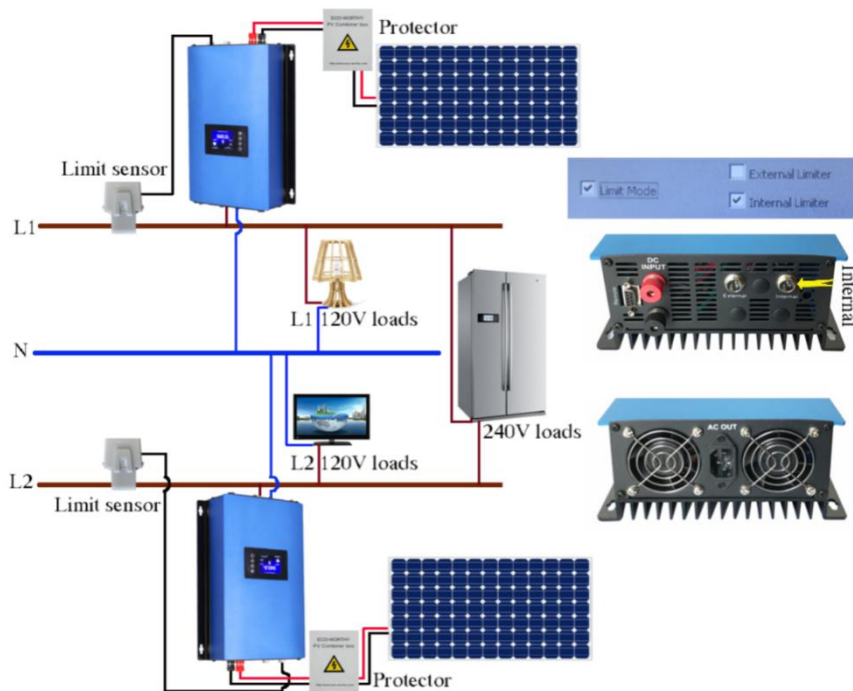
If 120V loads and 240V loads were mixed, and the 240V loads were connected before 120V loads, the inverter and limit sensor can be installed as picture 6.



Picture 6: Connecting method for Compensating mixed loads

With this connecting method, because the total loads' consumption at L1 and L2 will not be the same, but the inverter will just produce the same value feed current at L1 and L2, so the limit sensor must clamp at the L1 or L2, which total loads' power is smaller, this will prevent extra countercurrent feeding to the AC grid, otherwise, there will be extra countercurrent feeding to the AC grid if the inverter can produce enough current to compensate the larger current at L1 or L2. If you connect a system like picture 3, loads' power at L1 must be less than loads' power at L2, otherwise, the limit sensor should clamp at L2.

Using two SUN-1000G2 inverters to connect with US split phase AC grid(Good solution)



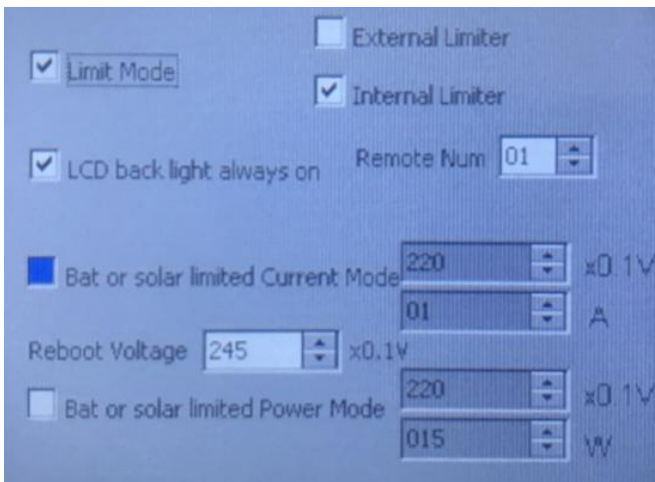
Picture 7: Connecting method for two SUN-1000G2 units

Using two SUN-1000G2 inverters to compensate L1 and L2 loads' current individually, with this method, the inverters' limit function can work very well, there will be no extra countercurrent feeding to the AC grid from L1

and L2, see picture 7. You also can just connect one SUN-1000G2 unit with a limit sensor at one of the live lines.

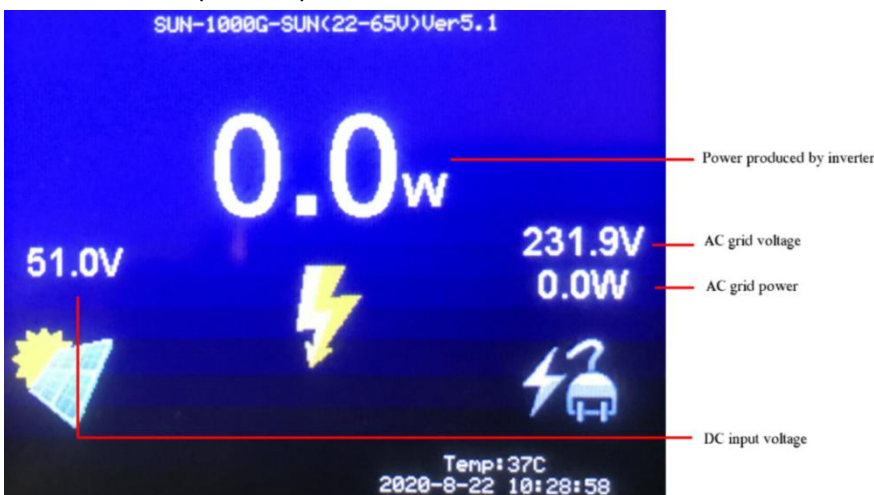
Important information:

After Having connected the inverters and limit sensors as one method listed above, If you want to use limit function, you also need to do below configuration on LCD display, You should select “Limit Mode” and “Internal Limiter” as picture 8.



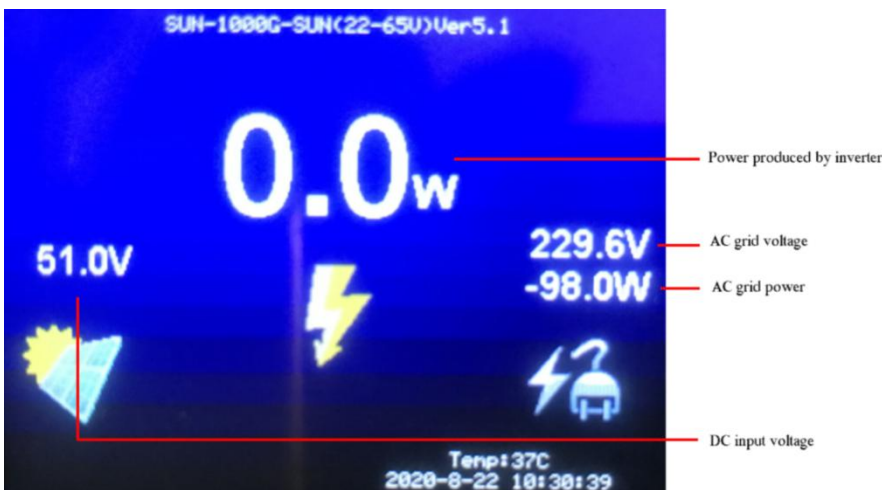
Picture 8: Limit mode configuration

If the display shows as picture 9, this means the limit sensor is not connected well, or there are no loads powered on, you can check the limit sensor and switch on some loads. If there is no loads' power, the inverter will not produce power under the limit model.



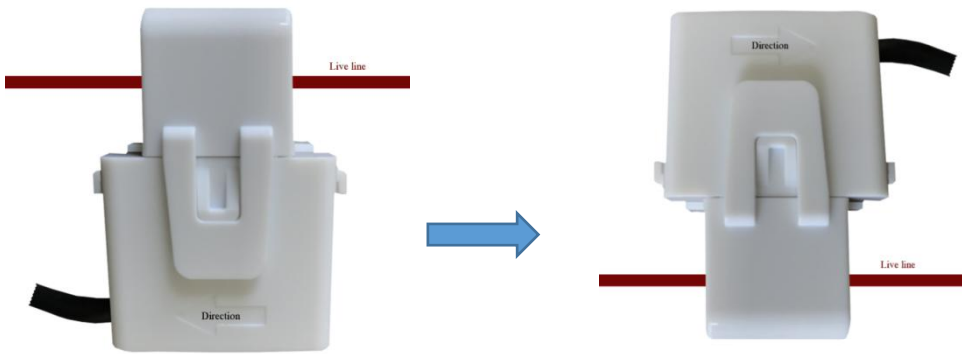
Picture 9: Zero AC grid power

If the display shows as picture 10, the AC grid power is negative, this means the clamping orientation of the limit sensor is wrong.



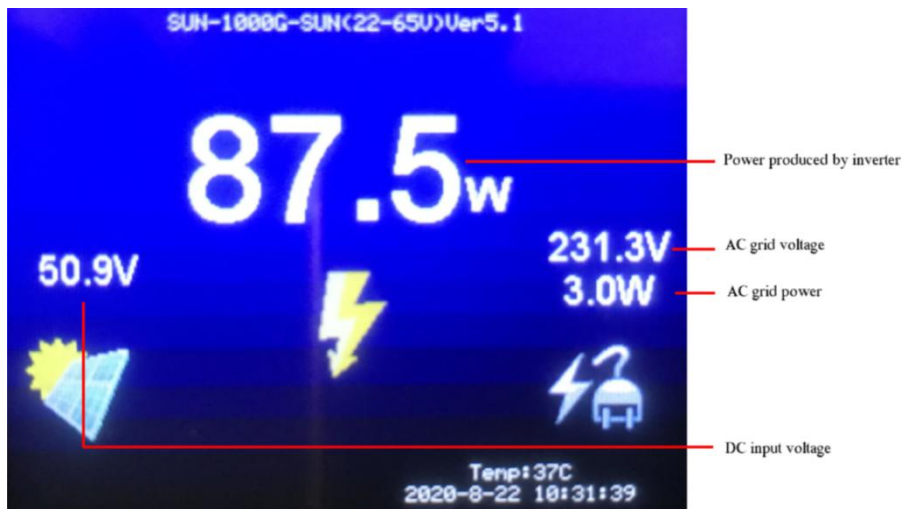
Picture 10: Negative AC grid power

If so, you need to clamp the limit sensor in the opposite direction as picture 11.



Picture 11: Correcting the orientation

If you did everything correctly, the LCD display should show as picture 12.



Picture 12: Correct working state

The inverter just produces almost the same power as the loads' power, so the AC grid just consumes very small power if the inverter can produce enough power to compensate the loads' power.

(Remark: Numbers on the LCD display will be different for different inverter and different using environment.)