



## Ensured constant power to a variable speed generator system

### General description

A variable speed generator (Dynawatt, Dometic<sub>Travel\_power</sub>) produces a precise 230VAc electrical voltage directly from a boat or vehicle engine, independently of engine speed. One problem is that the power output depends on speed of the engine.

By adding to the system an Xtender, it is possible to ensure a constant power at the output whatever the speed of the engine, which allows the use of all loads at all times.

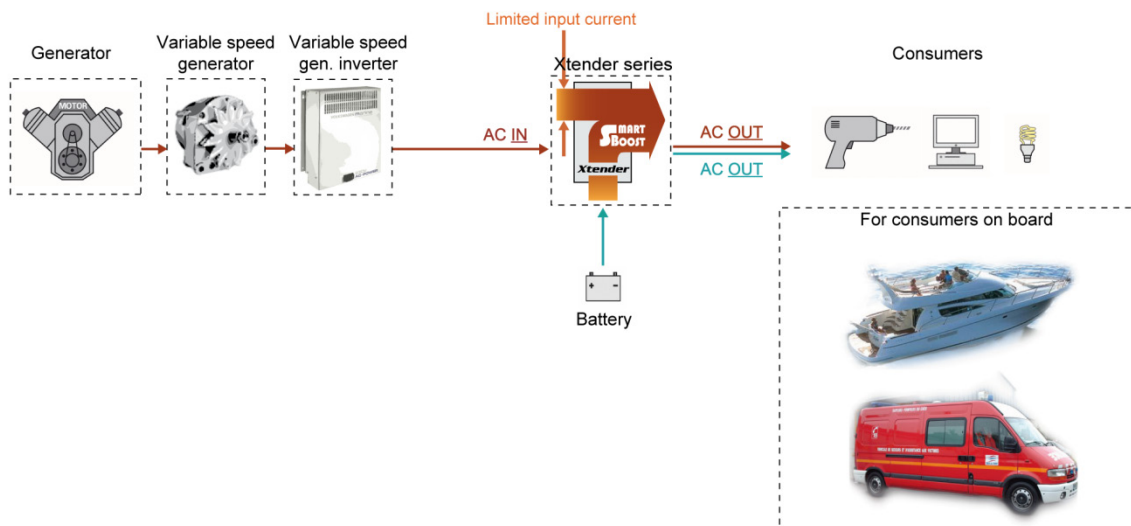
### Features & advantages

- Ensure a constant power output even with a reduced engine speed
- Possibility to have more power available (Variable speed generator power and Xtender power added together)

### Minimal configuration

- Range of inverters
  - All Xtender Series
- RCC02 / 03
  - Software vers. : **1.3.8 and higher**
  - RCC User level : **EXPERT**

### Application Schematic



(Figure 1) Variable speed generator with Xtender

## Detailed description

### Operation description

The output power of a variable speed generator depends directly on the speed of the motor. When the motor speed is too low for the power demand, the output voltage of the generator is decreased.

To avoid this problem, a permanent measurement of the input AC voltage allows working with generators that are limited in power when the motor is running at a low speed.

The drop voltage is detected and the input current of the Xtender is diminished to stabilize the voltage. Thereafter, the Smart-Boost function<sup>1</sup> is used to help the source with the necessary power.

With that association, all the power is available even when cruising at low speed.

### Parameters & descriptions

Six parameters allow controlling this function :

1. "Maximum source AC current (power sharing)" **{1107}**.

↳ is used to set the maximum current the generator can give.

Example for an generator of 5500W :  
 $\text{Max input current } \{1107\} = 5500\text{W} / 230\text{Vac} = 24\text{Aac}$

2. "Decrease max input limit current with AC-In voltage" **{1527}**.

↳ activates the function that decreases the max input limit current with the AC-In voltage.

3. "Smart-Boost allowed" **{1126}**.

↳ helps the generator by adding the missing power when the motor speed is too low.

4. "AC input low limit voltage to allow charger function" **{1309}**.

↳ is the lowest input voltage (where the input current of the generator must be set at 0).

5. "Adaptation range of the charge current according to the input voltage" **{1433}**.

↳ is the range of voltage between whom the current will be adapted.

6. "Immediate detection of input voltage loss" **{1435}**. (Optional)

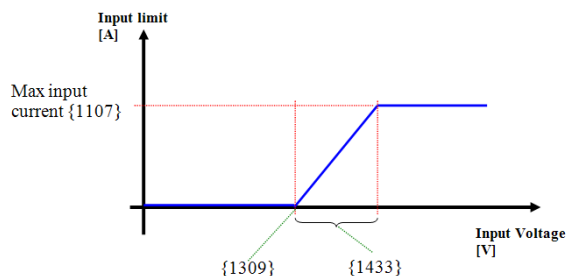
↳ Allows to starting the inverter mode as quick as possible in case of fluctuations of the AC-in grid. This function is useful when it comes to very sensitive loads that require an uninterruptible power supply (UPS).

### Principle of operation

The max input current **{1107}** is decreased down to 0 at the **{1309}** voltage over a range given by the parameter **{1433}**. (See figure 2)

The recommended values are 185V for the limit voltage **{1309}** and 30V for the voltage hysteresis **{1433}**.

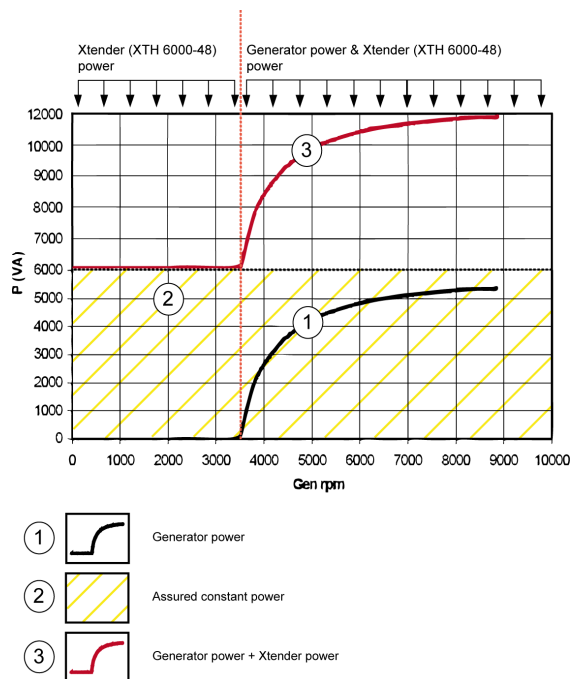
Thus, from 215V the max input current is decreased down and is at 0 when the voltage is at 185V. In this way, the Xtender helps the generator which can't provide power on account of the low-speed motor.



(Figure 2), Principle of the decrease of max input current

### Example of Power curve

(system with an XTH 6000-48)



(Figure 3), Typical power curve of a variable speed generator and representation of ensured constant power and additional system power

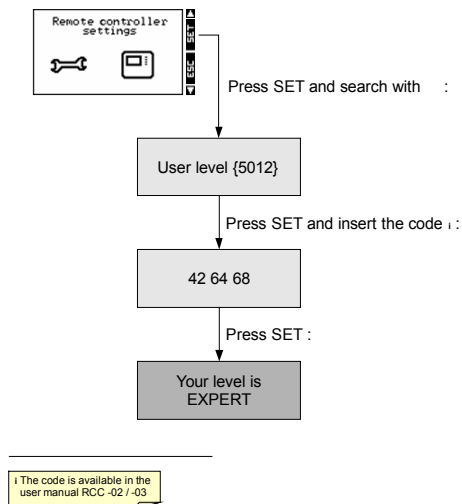
### Notes

<sup>1</sup> Associated application notes :

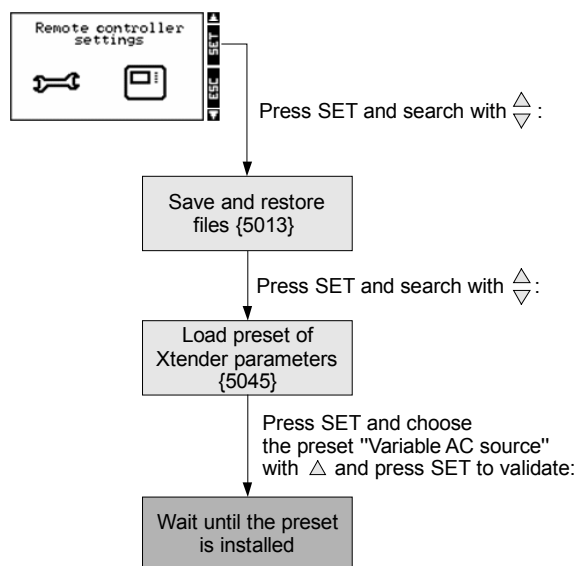
- ▶ AN001 AC source assistance (Smart Boost function)

## RCC -02 / -03 programming guide

### Go to Expert level



### Load preset "Variable AC source" <sup>i</sup>



#### Notes

<sup>i</sup> Preset "Variable AC source" description available at the next page.

## Description of the preset “Variable AC source”

If it is not possible to obtain the preset “Variable AC source”, it is possible to set by yourself the RCC -02 / -03 using the parameter description below.

Applicable from soft. version 1.3.8 and higher | **XTH/M 12 – 24 – 48 VDC**

### Menu AC-IN AND TRANSFERT

Param	1107:	Max source AC current (Power Sharing)   <b>15 [Aac]</b>
Param	1527:	Decrease max input limit current with AC-In voltage   <b>Yes</b>
Param	1126:	Smart-Boost allowed   <b>Yes</b>
Param	1435:	Immediate detection of input voltage loss (UPS)   <b>Yes</b>

### Submenu Charge current derating

Param	1309:	AC input low limit voltage to allow charger function   <b>185 [Vac]</b>
Param	1433:	Adaptation range of the charge current according to the input voltage   <b>30 [Vac]</b>



Note that the parameter values must be adjusted depending on the system.

### Example of installation

Fieldtests and pictures by eMbed Engineering ( <http://www.embedengineering.nl> )



(Figure 4), Variable speed generator on a boat engine



(Figure 5), Variable speed generator inverter and an Xtender

