

Quick guide:

Reactive Power settings in dependence of the grid voltage (according to AS/NZS 4777.2:2015*)

*According to network operators requirements on Fronius SnapINverters Galvo, Primo, Symo, Eco

White Paper

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Gender-specific wording refers equally to female and male form.

1 GENERAL

PV systems may only feed energy into the grid if the grid voltage is within specified limits. Peaks in generation or overvoltage in power grids can cause the voltage to approach the upper limit values, which leads to undesired shutdowns of inverters. Voltage stability at the switchboards can be actively influenced by monitoring the effective and reactive power fed into the grid.

One solution is to simply decrease the effective power feed-in to the grid in order to reduce high grid voltage levels. But this usually reduces the energy generated by the photovoltaic system in direct proportion.

One alternative is to switch the reactive power between the inverter and the grid. Even though the reactive power is not consumed or converted into effective power and simply oscillates between the inverter and the grid, the electricity feed-in will increase. Regardless of the active power and therefore regardless of the energy yield, switching the reactive power can cause the voltage to both rise and to fall. Therefore, adjusting the reactive power-flow depending on the current grid voltage can help to stabilise the voltage and avoid values over the allowed operating limit of the inverters.

The Fronius SnapINverter range can influence both effective power and reactive power in a targeted manner. This document provides a “quick guide” on how to set the characteristic points of the reactive power flow and the grid voltage settings located in the hidden Service Menu without breaking the requirements requested by distribution network providers (DSNP) and the new AS/NZS 4777.2:2015 standard.

For more detailed information regarding the Service Menu settings, please request the Service Menu Manual from Fronius Australia Technical Support.

The hidden Service Menus on the Fronius SnapINverters (Galvo, Primo, Symo, ECO) are accessed via the inverter's display with use of a password. The Reactive Power Mode settings are a part of the 'PROFI' service menu and require the use of a password that is issued by Fronius Technical Support upon the completion of the “Request for Access code Grid parameters Fronius Inverters” form.

Once this form has been completed and logged, Fronius Technical Support will issue the password.

Fronius Australia Technical Support

Email: PV-Support-Australia@fronius.com

Phone: 03 8340 2910

Note!

Any altered grid parameter settings need to be approved by the corresponding DSNP!

2 SETTINGS

Before programming the following settings the inverter must have the latest software version installed.

The latest USB version for the SnapINverter range can be downloaded from the Fronius website via http://www.fronius.com/cps/rde/xchg/SID-D8B2A594-F670E8D4/fronius_australia/hs.xsl/25_7671.htm

In some cases the Country Setup will need to be re-loaded after the software update is completed.

2.1 Enter the hidden 'PROFI' menu



Press the 3rd button 5 times

Type in the access code for the hidden **PROFI** menu*



*Available only upon request from Fronius Technical Support.

2.2 Setting Limits and Operating range of Voltage and Reactive Power

Reactive power mode is restricted by the maximum output current (maximum apparent power) as well as by the operational reactive power limits. Fronius inverters can provide a certain percentage of the maximum apparent power as reactive power. Additionally, the adjustment of the reactive power output has to happen within the voltage limits of the new AS/NZS 4777.2:2015 Standard.

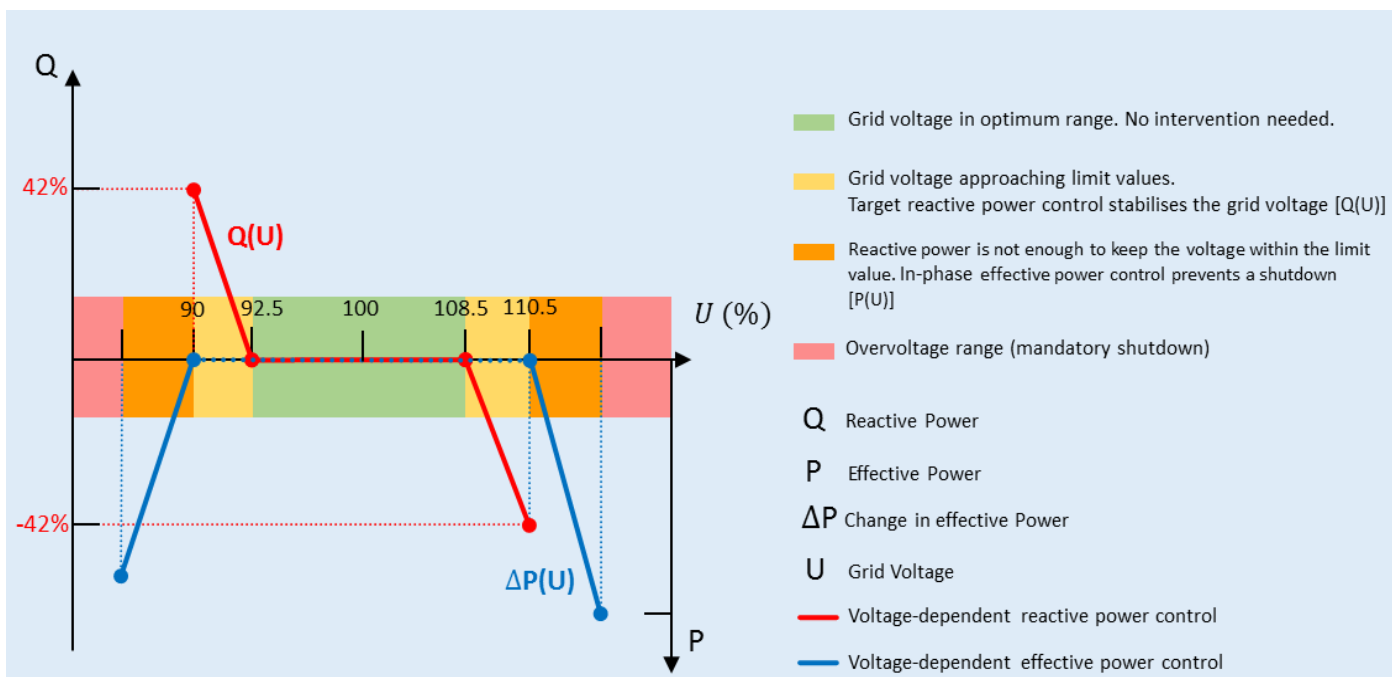
This chapter is divided into two Stages:

- **Stage 1:** Setting the In/Output values of the reactive Power in dependence of the certain voltage value
- **Stage 2,** setting the limits for the Power reduction range and the maximum In/Output of the reactive Power

2.2.1

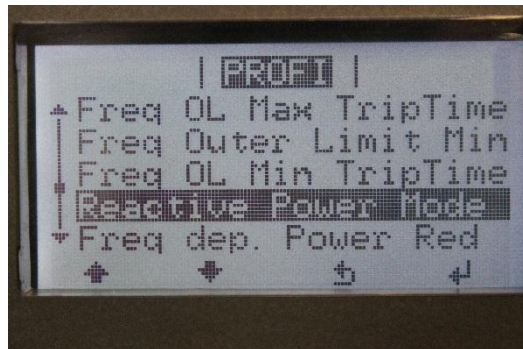
Stage 1:

We are setting the values after the following power / voltage diagram:

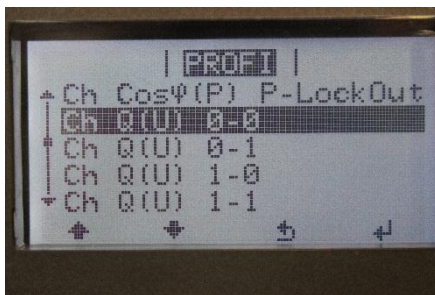


On the inverter screen:

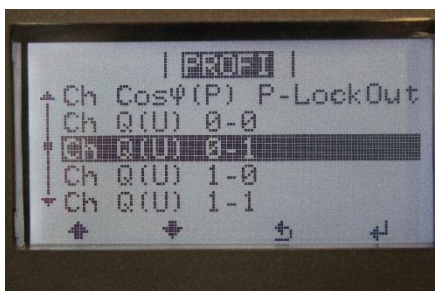
Go to tab "**Reactive Power Mode**" and enter



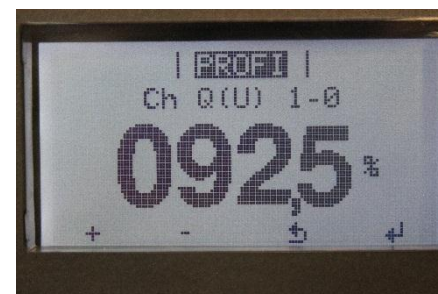
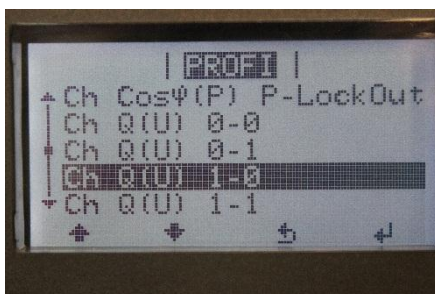
Select tab "**CH (U) 0-0**" and enter **090.0 (%)**



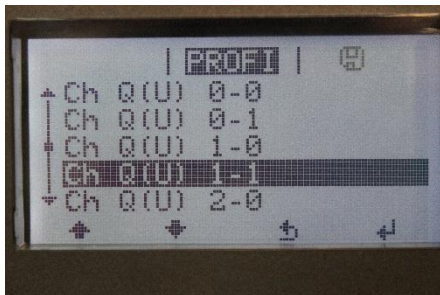
Go down to tab "**CH (U) 0-1**" and enter **+42.00 (%)**



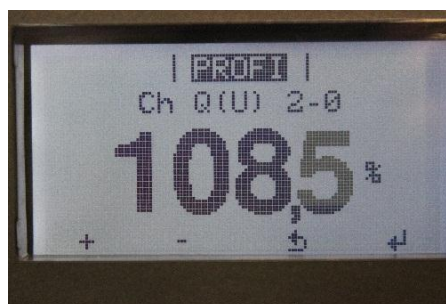
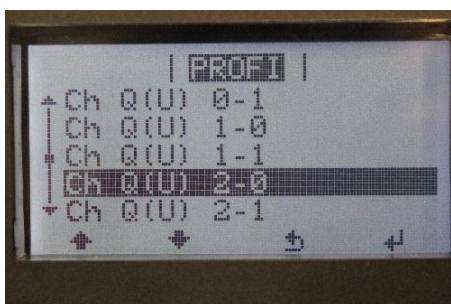
Go down to tab "**CH (U) 1-0**" and enter **092.5 (%)**



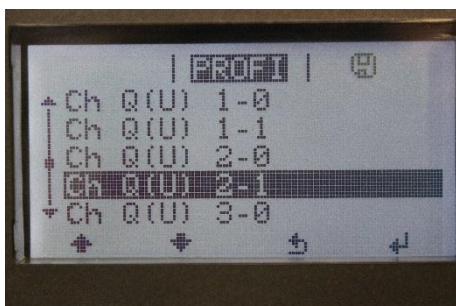
Go down to tab "**CH (U) 1-1**" and enter **+00.00 (%)**



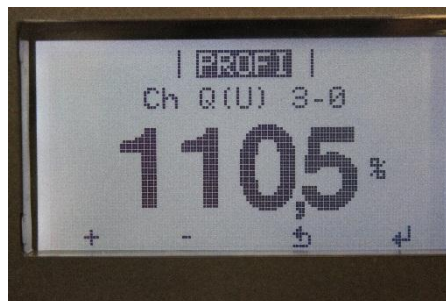
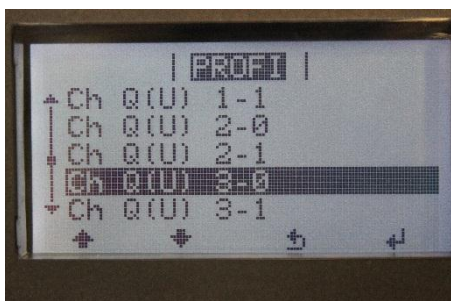
Go down to tab "**CH (U) 2-0**" and enter **108.5 (%)**



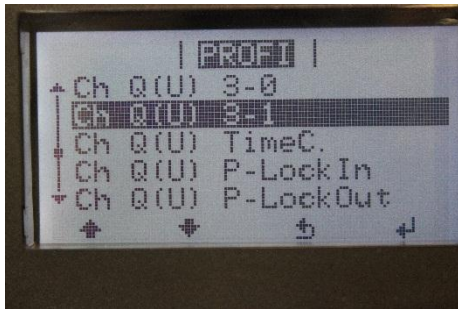
Go down to tab "**CH (U) 2-1**" and enter **00.00 (%)**



Go down to tab "**CH (U) 3-0**" and enter **110.5 (%)**



Go down to tab "**CH (U) 3-1**" and enter **-42.00 (%)**

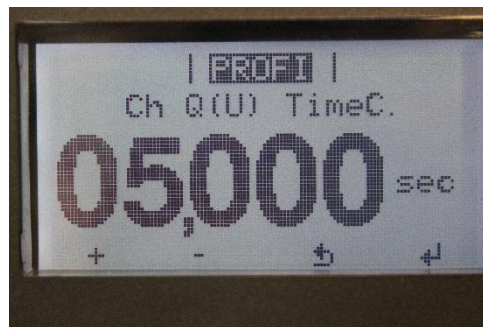
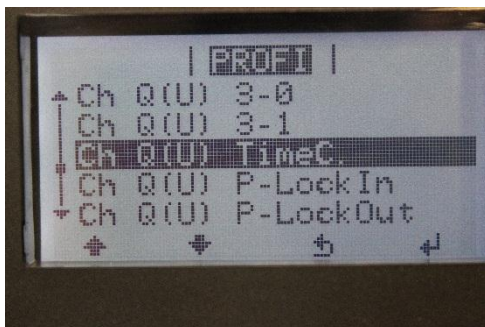


2.2.2

Stage 2:

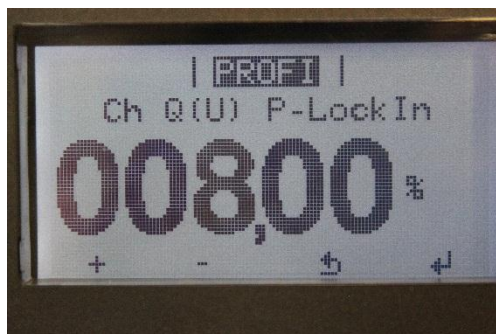
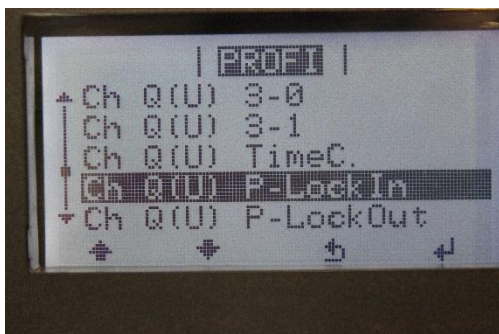
Go to tab "**Ch Q (U) P - TimeC**" and enter **05.000 (sec)**

We set a time constant in which the inverter will steadily adjust the power to the specific voltage level, in order to avoid (hard) ramping of the reactive power, which can cause damage on the pc board over a long time.



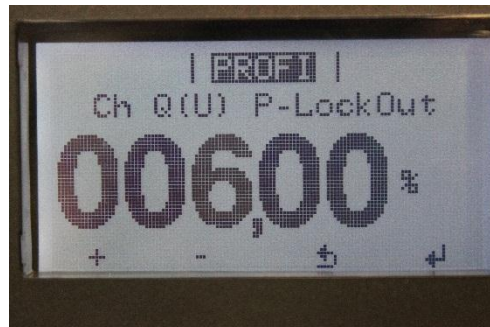
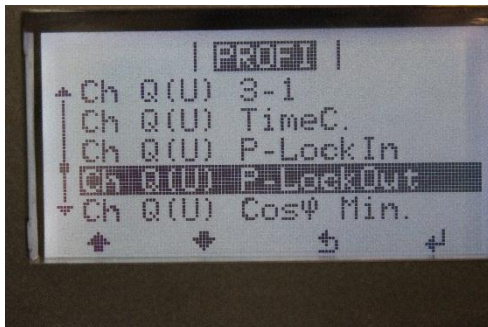
Go to tab "**Ch Q (U) P - Lockin**" and enter **08.00%**

Input of a power value. When this power value is exceeded the Q (U) characteristic is activated.



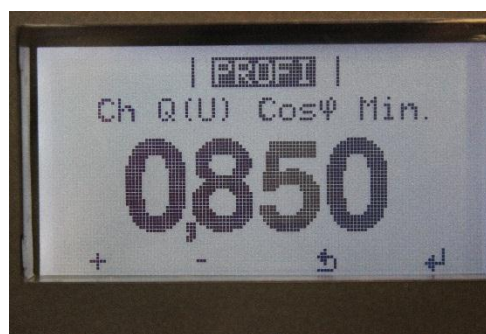
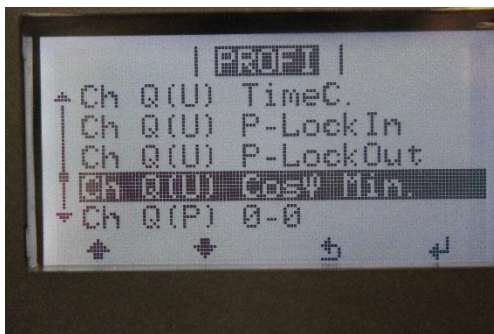
Go to tab "**Ch Q (U) P - Lockout**" and enter **06.00%**

Input of a power value. When this power value is undershot the Q (U) characteristic is deactivated.



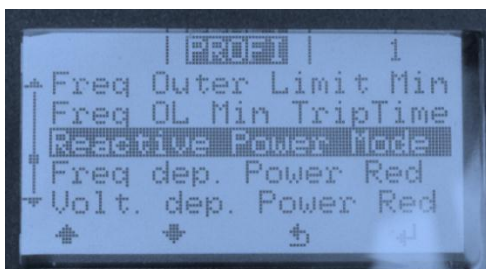
Go to tab "**Ch Q (U) Cosφ Min**" and enter **0.900 (Power factor)**

Input of a minimum cos phi value at which the inverter may feed in power. This defines the maximum output of the reactive power.

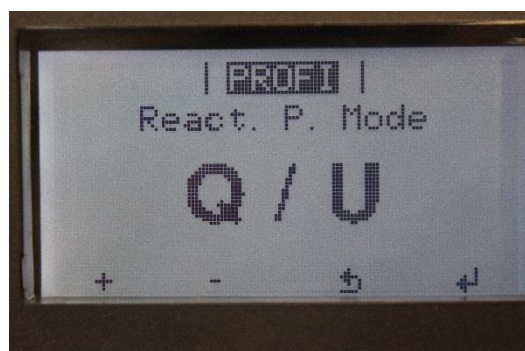
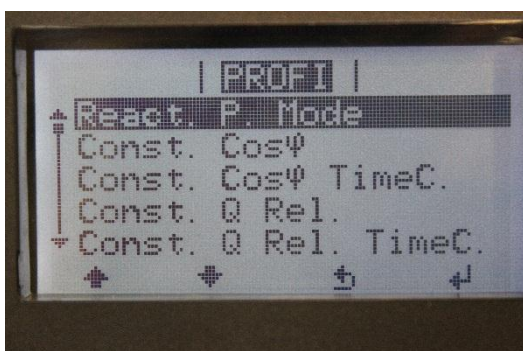


2.3 Activate reactive power depending on the grid voltage

Go to menu tab "**Reactive Power Mode**" and press enter



Under the menu tab "**React. P. Mode**" select "**Q / U**" (= Reactive Power (Q) depending on Grid Voltage (U)) and press enter.



- + Leading value
- Lagging value

For more detailed information see the operation manual available on the product specific page on www.fronius.com.au