



SG250HX/SG250HX-IN/SG250HX-IN-20

P-Q Diagram

SUNGROW

1. Introduction

This document describes the P-Q capability of SG250HX/SG250HX-IN/SG250HX-IN-20 string inverter.

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2. P-Q Diagram Description

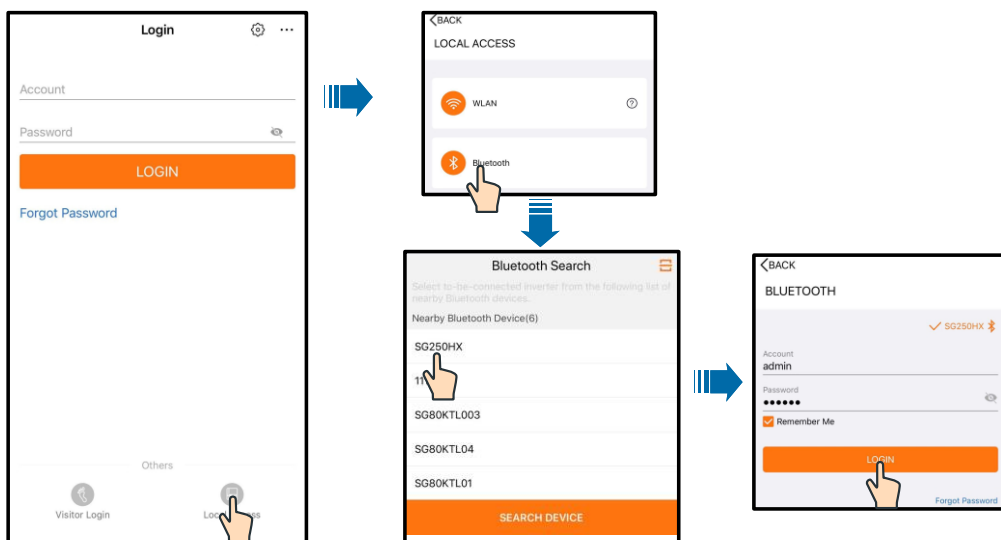
The inverter can support the grid by supplying the reactive power in different ways.

2.1. Mode of Reactive Power Regulation through Fixed Power Factor (Pf mode)

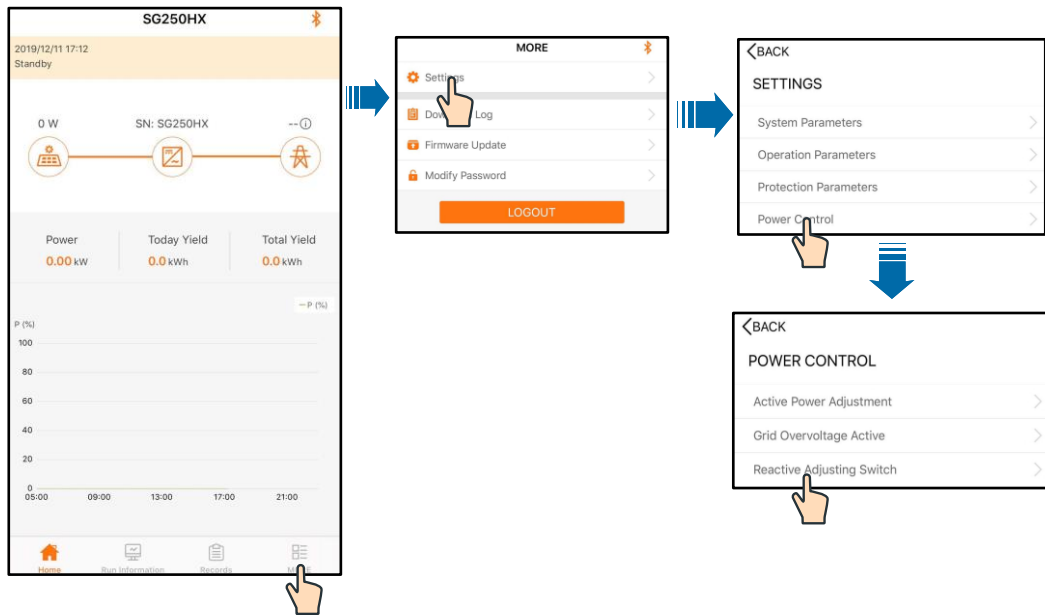
Pf mode: the power factor is fixed and reactive power setpoint is calculated according to the current power.

The steps to set the Pf mode via iSolarCloud App are as follows.

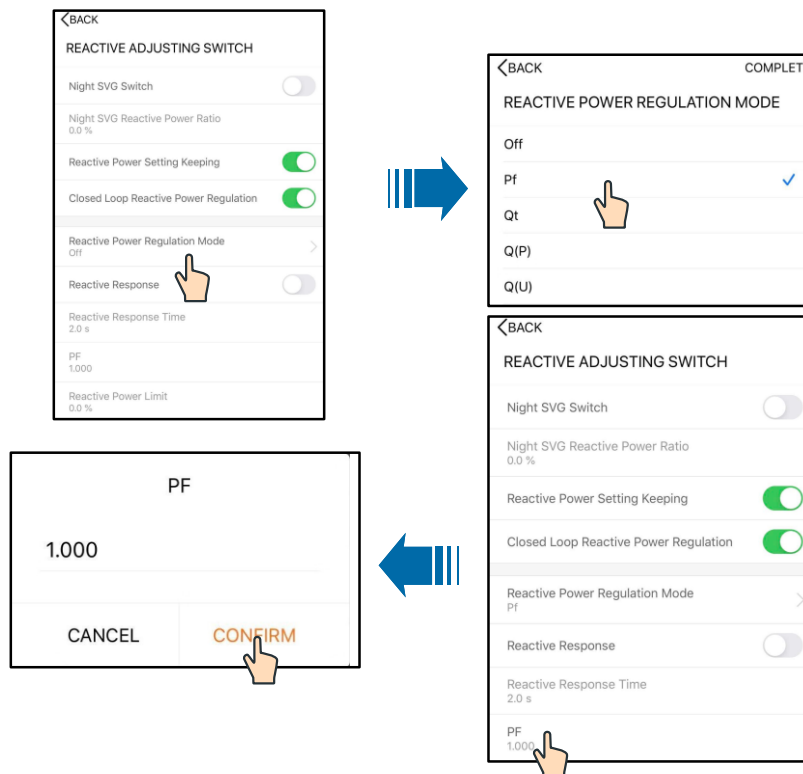
1. Access the App via Bluetooth, enter the account name and password to enter the main page.



2. Click "More" > "Settings" > "Power Control" > "Reactive Adjusting Switch" to enter the reactive adjusting interface.



3. Enable the “Reactive Power Regulation Mode” to “Pf” and set the power factor value.



The adjustable range of the power factor is -0.8~+0.8, and the adjustment curve in the Pf mode is shown in the figure below. The shaded area in the figure shows the P-Q capability of the inverter in Pf mode.

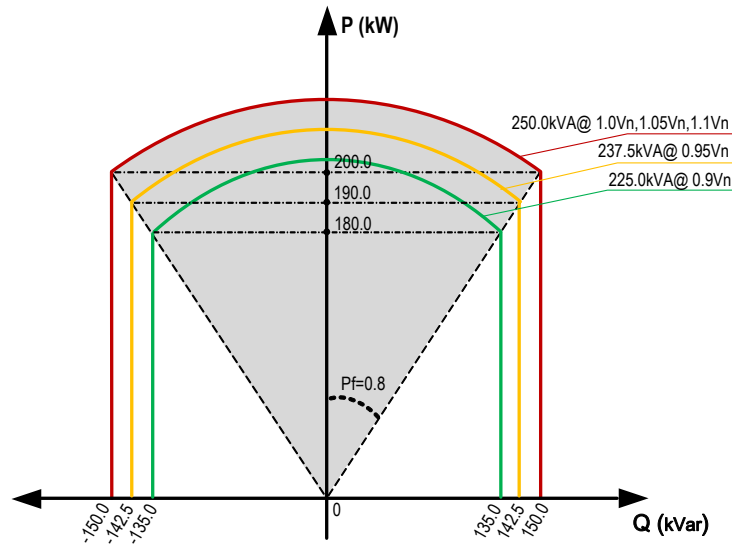


Fig.1. P-Q Diagram (Pf mode) @30°C

2.2. Mode of Reactive Power Regulation through Fixed Reactive Power Ratio [Q(t) mode]

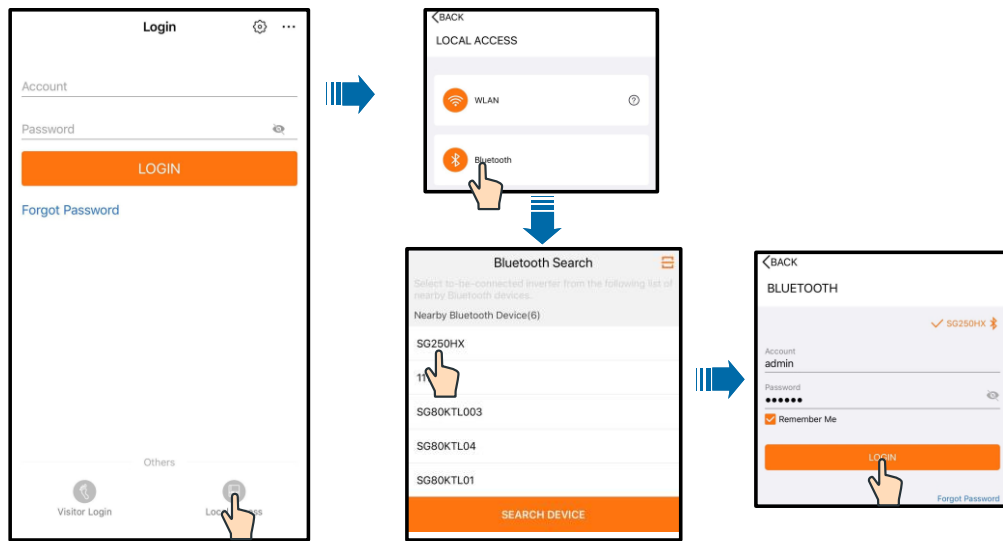
In the Q(t) mode, system rated reactive power is fixed, and the system outputs reactive power according to the delivered reactive power ratio.

For example, the max. reactive power of SG250HX is $0.6S_{max}$ (corresponding reactive power ratio is 100%) ($S_{max}=1.1P_n=250kVA$), and the "Reactive power limit" (namely Reactive power ratio value) is set through the App. Inverter outputs reactive power according to the set value. If the parameter "Reactive power limit" is set to 40.0%, the reactive power output is $(0.6S_{max}) * 40.0\% = (0.6 * 250) * 40.0\% = 60kVar$.

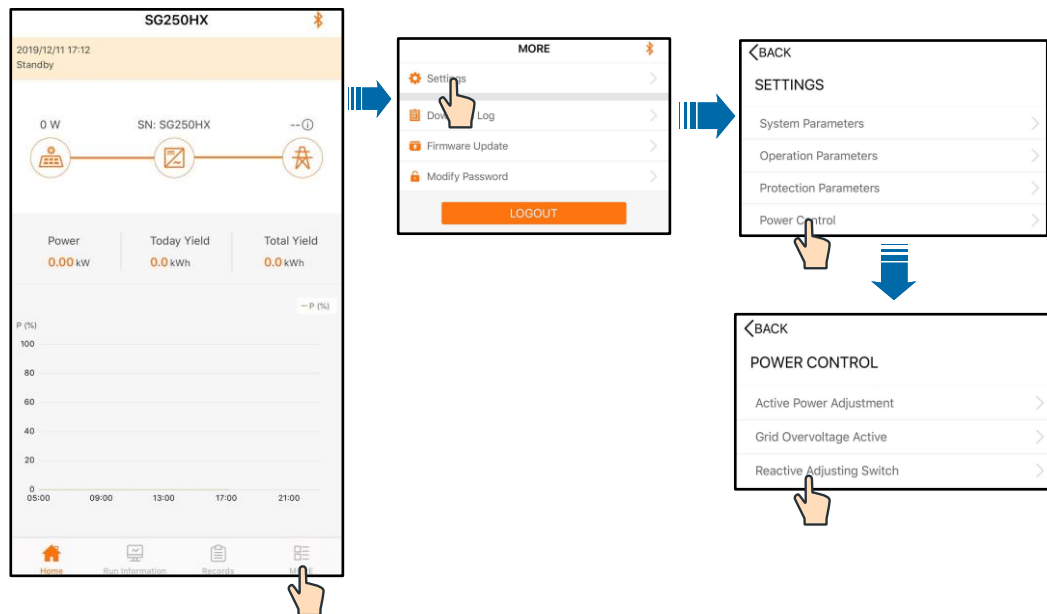
The setting range of the reactive power ratio is 0~100% or 0~-100%, corresponding to the ranges of inductive and capacitive reactive power regulation respectively.

The steps to set the Q(t) mode via iSolarCloud App are as follows.

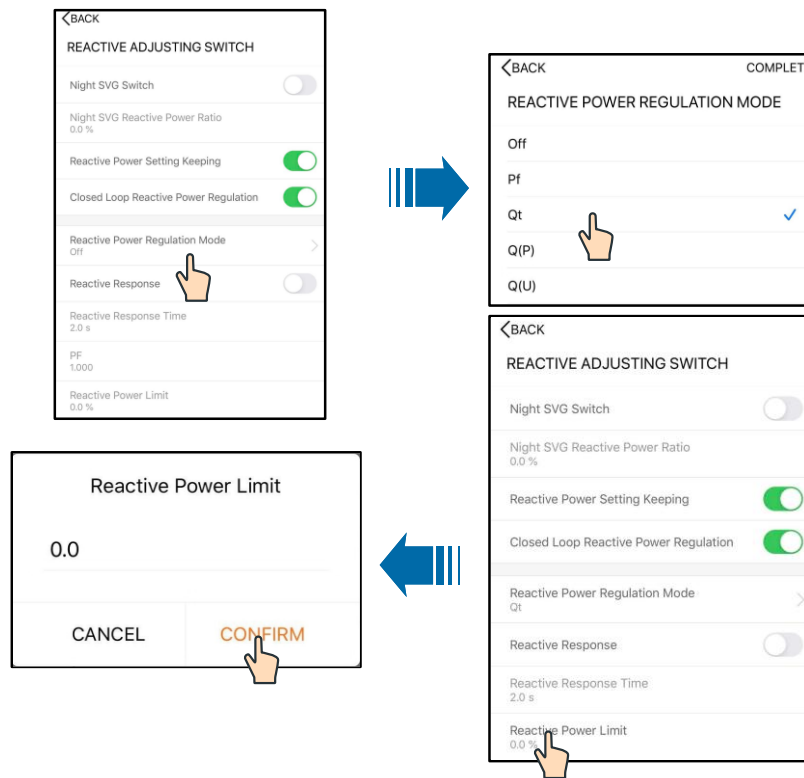
1. Access the App via Bluetooth, enter the account name and password to enter the main page.



2. Click "More" > "Settings" > "Power Control" > "Reactive Adjusting Switch" to enter the reactive adjusting interface.



3. Enable the "Reactive Power Regulation Mode" to "Q(t)" and set the reactive power limit.



The setting range of the “Reactive power limit” is -100.0% to 100.0%, and the setting accuracy is 0.1%. The figure below shows the adjustment curve in Q(t) mode. The figure in the below shows the P-Q capability of the inverter in Q(t) mode.

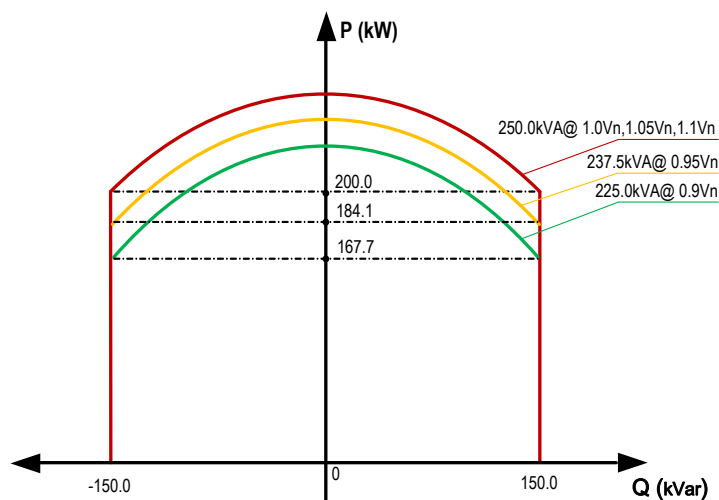


Fig.2. P-Q Diagram [Q(t)mode] @30°C