



Training Document

Fronius IG Plus Advanced

EN



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Division SE/ Technical Support

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Welcome

We welcome you to the "Fronius IG Plus Advanced".

This document is for your reference and will help you should you have any questions later.

The aims of this training are as follows:

The participant can support customer with the technical Know How he learned in this training.

We wish you an enjoyable and successful training!

TSI SE

Master Trainer International

Christoph Staudinger

For further information, please contact:

Technical Support SE , pv-support@fronius.com, +43 (7242) 241 5670

1 Technical Facts

Technical Facts

Fronius IG

KEEP APPROVED – IMPROVE EXISTING FEATURES

- HF Concept
- Module Manager
- Transformer switch
- MIX™ Concept
- Service concept
- Universal product design
- Menu and Displaynavigation
- Plug & Play for DatCom
- Selfdiagnosticsystem



Technical Facts

Fronius IG Plus product range



- Fronius **IG Plus 35**
 - Fronius **IG Plus 50**
 - Fronius **IG Plus 70**
 - Fronius **IG Plus 100**
 - Fronius **IG Plus 120**
 - Fronius **IG Plus 150**
- Single phase
- Two phase
- Three phase

with MIX™-Concept

Technical Facts

Technical Data

Type	Fronius IG Plus 35	Fronius IG Plus 50
DC part		
MPP-Range DC from (V)	230	230
MPP-Range DC until (V)	500	500
Max. Voltage DC (V)	600	600
Amount of MPP tracker	1	1
AC part		
Maximum Power AC(kW)	3,5	4,0
Max. Current/Phase AC (A)	15,2	17,4
Amount of phases	1	1
Efficiency		
Max. efficiency (%)	96,0	96,0
Euro efficiency (%)	95,0	95,1
Protective system	IP44	IP44
Weight (kg)	25	25



Technical Facts

Technical Data

Type	Fronius IG Plus 70	Fronius IG Plus 100
DC part		
MPP-Range DC from (V)	230	230
MPP-Range DC until (V)	500	500
Max. Voltage DC (V)	600	600
Amount of MPP tracker	1	1
AC part		
Maximum Power AC(kW)	6,5	8,0
Max. Current/Phase AC (A)	28,3	34,8
Amount of phases	1 or 2	1 or 2
Efficiency		
Max. efficiency (%)	96,0	96,0
Euro efficiency (%)	95,4	95,5
Protective system	IP44	IP44
Weight (kg)	38	38



Technical Facts

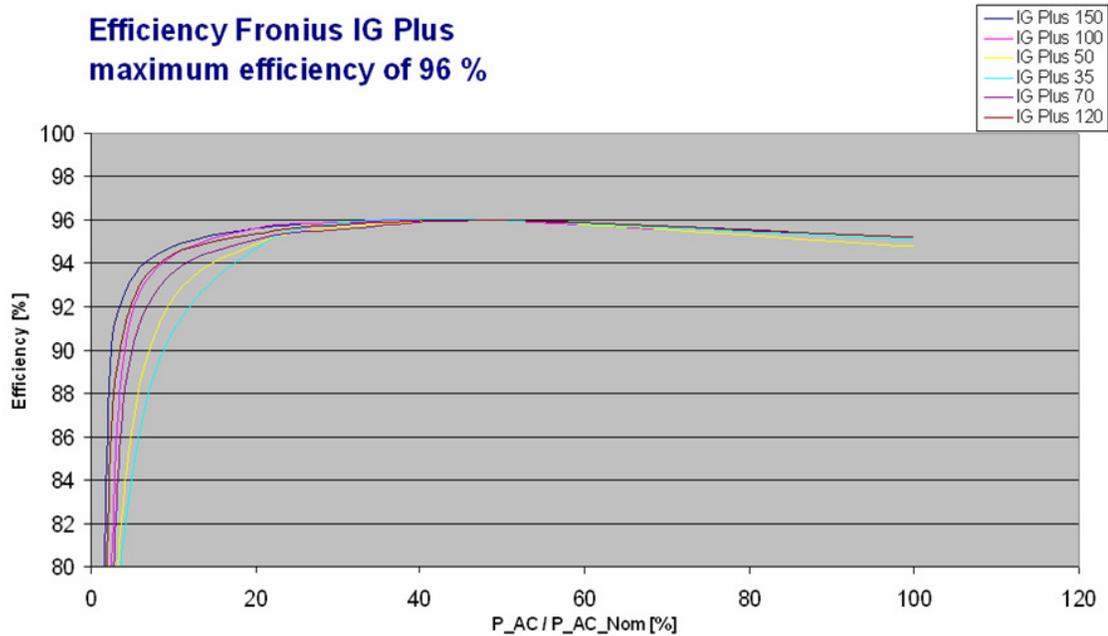
Technical Data

Type	Fronius IG Plus 120	Fronius IG Plus 150
DC part		
MPP-Range DC from (V)	230	230
MPP-Range DC until (V)	500	500
Max. Voltage DC (V)	600	600
Amount of MPP tracker	1	1
AC part		
Maximum Power AC(kW)	10,0	12,0
Max. Current/Phase AC (A)	14,5	17,4
Amount of phases	3	3
Efficiency		
Max. efficiency (%)	96,0	96,0
Euro efficiency (%)	95,5	95,5
Protective system	IP44	IP44
Weight (kg)	49	49



2 Fronius IG Plus Features

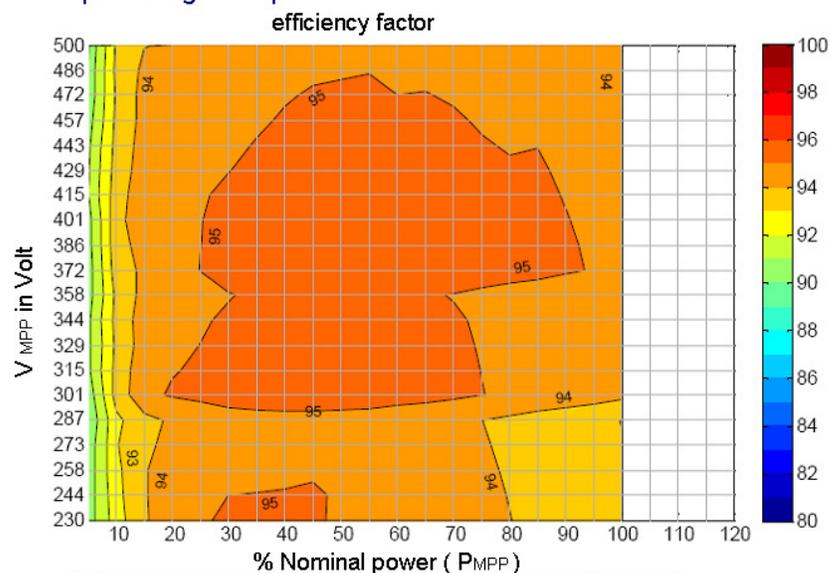
Fronius IG Plus Features



Fronius IG Plus Features

Constantly high efficiency factor

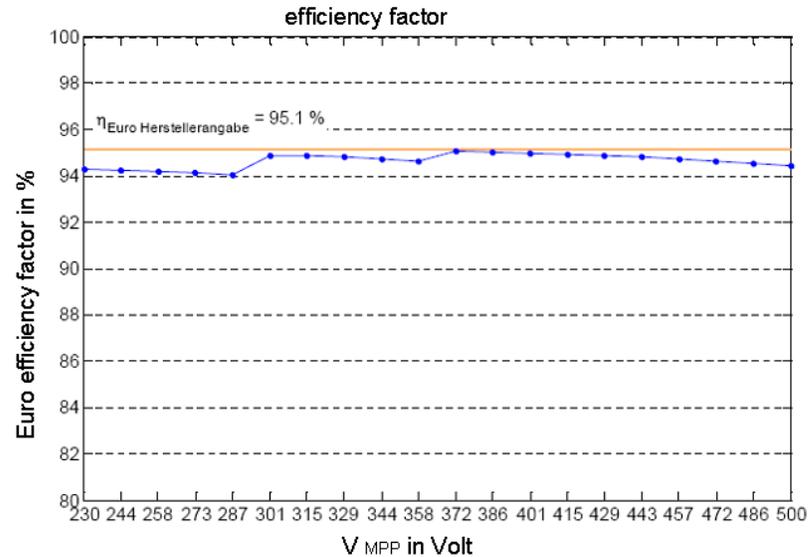
- Independent of input voltage and power



Fronius IG Plus Features

Constantly high efficiency factor

- independent of input voltage(Transformer switch with 3 efficiency peaks)



arsenal research
Ein Unternehmen der Austrian Research Centers

Tests were done from arsenal research , an independent Testinstitut

Fronius IG Plus Features

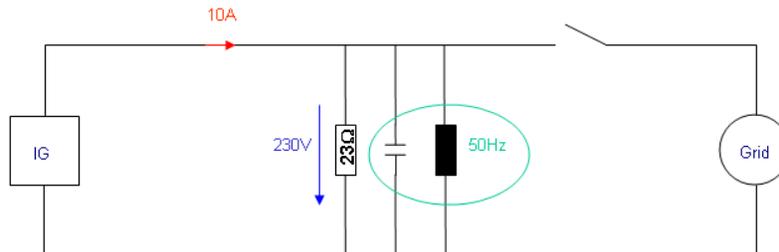
Softwarefeatures



- sophisticated Software of IG series developed further (Module Manager, Transformer switch , Failedetection)
- Digital Signal Processor of the latest generation
- Grid monitoring after VDE 0126 1-1

Fronius IG Plus Features

Grid monitoring



IG feeds into the public Grid

Power is consumed by the Loads totally

Inductive and capacitive Loads work as a 50 Hz resonant circuit

Islanding condition

Breaker to the Grid can be opened without a change of voltage and frequency of the Grid at the IG

IG needs to detect that no grid is connected and disconnects immediately

Fronius IG Plus Features

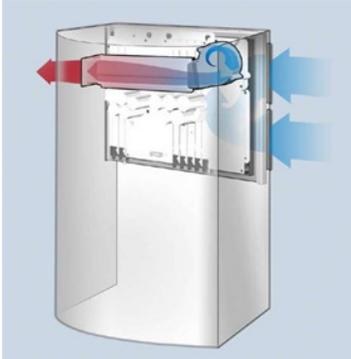
Power Relay Card



- Power Relay Card triggers a switch as soon as the inverter is powered by the PV modules:
- Relay: open → night
 closed → day
- Because of this feature, it's possible to disconnect the inverter from the grid during night.

Fronius IG Plus Features

Intelligent ventilation concept



General

- ✓ Air can't get directly in contact with semiconductors and avoids dust on the components

RPM regulated Fan Control

- ✓ Two RPM regulated and temperature-controlled Fans increase the lifetime of the whole inverter

Protection class IP44

- ✓ can be used for Outdoor installation



Fronius IG Plus Features

Insects and Dust protection



General

- ✓ At the back, where the air comes in, additionally an Insects and Dust protection is fitted. This avoid direct contact with dust on the components.



Fronius IG Plus Features

Worldwide suitable



- Compliance with the Norms (DIN VDE 0126-1-1, DIN VDE 0100-712 ...)
- Country Setup on site adjustable
- Service (Exchange of power-stack and single components instead of exchange of whole unit)

Fronius IG Plus Features

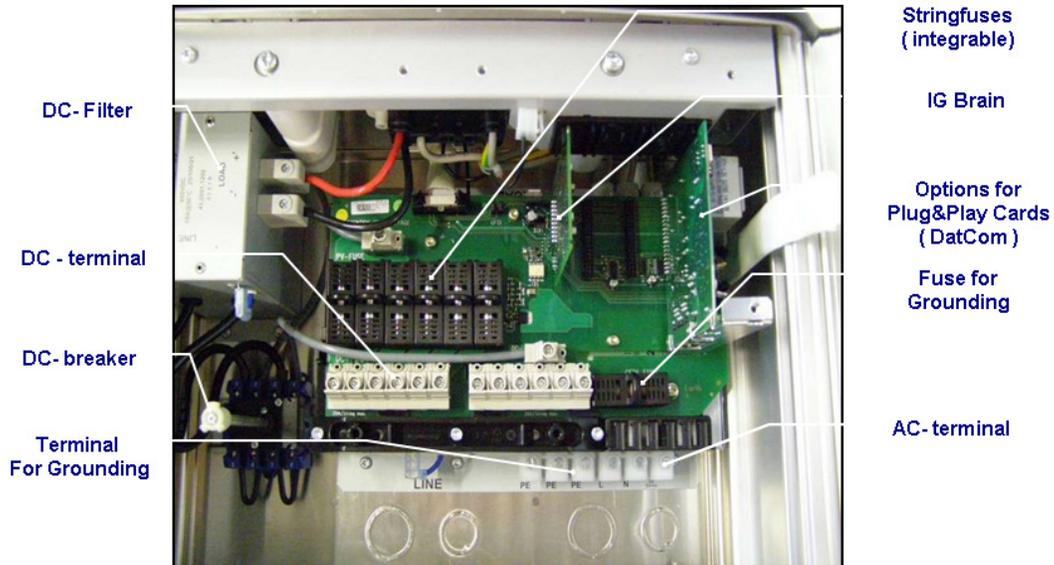
Features Fronius IG Plus

Power plus system (Connection area and power-stack are mounted separately)



Fronius IG Plus Features

The connection area



Fronius IG Plus Features

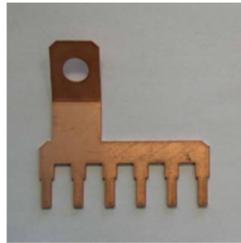
Integrated mechanical DC-breaker

For comfort and safety after DIN-VDE 0100-712



Fronius IG Plus Features

Features IG Plus



Connection higher than 16 mm² possible

- Drill in connection area which can get broken through
- Possibility for mounting additional PG gland (M32)

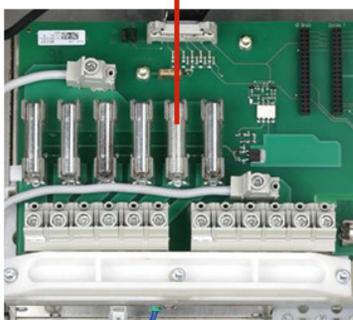
Flexibility in the connection

- Neck from M40 to M32

Fronius IG Plus Features

Stringfuses & Failedetection

Stringfuses



New Modul Test Standards EN 50380 or IEC 61734

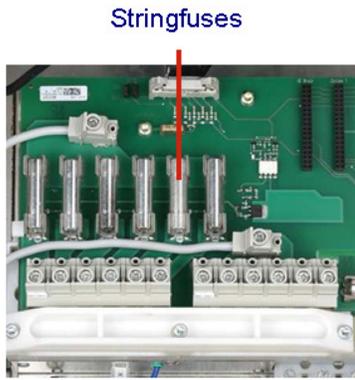
- obligates the manufacturer of the module to give details to the reverse current and to the protection

Advantage of IG Plus

- ✓ Stringfuses can be integrated directly in the inverter
- ✓ No additional Box or Stringdiodes necessary

Fronius IG Plus Features

Stringfuses & Failedetection



General

- ✓ Stringfuses can be added additionally (metalbolts are supplied and integrated)

When should Stringfuses be used ?

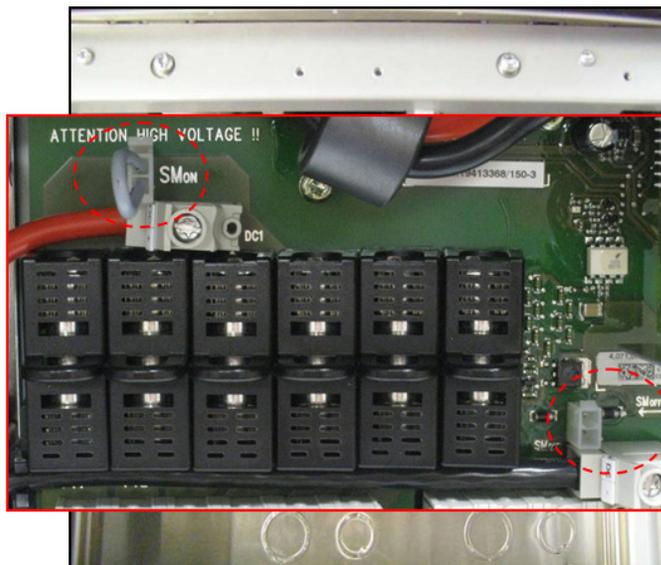
- ✓ If the current which can occur in case of a failure exceeds the maximum reverse current of the module or the maximum permissible current of the DC cables.

Monitorisation of the Stringfuses

- ✓ every single Stringfuse is monitored
- ✓ Statusmessage at defect of a Stringfuse

Fronius IG Plus Features

Measuring of single strings



Information:

- ✓ For a correct measurement the Jumper has to be set from

SMON to **SMOFF**

SMON ... Internal Stringmeasurement active

SMOFF... Internal Stringmeasurement inactive

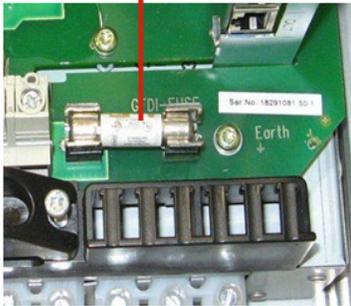
After measurement the Jumper has to be set back, otherwise

STATE 550

Fronius IG Plus Features

Stringfuses & Failedetection

Modulgrounding



Mode „Modulgrounding“

- ✓ After activating Mode „Modulgrounding“ automatically the Isolationmeasurement got disabled

Monitorisation of Modulgrounding

- ✓ In case of a damaged fuse a Statusmessage comes up on the Display

High resistance 100k grounding

- ✓ Instead of positive or negative grounding, it's possible to activate a high resistance grounding.

3 Servicemessages

Servicemessages

Servicecodes

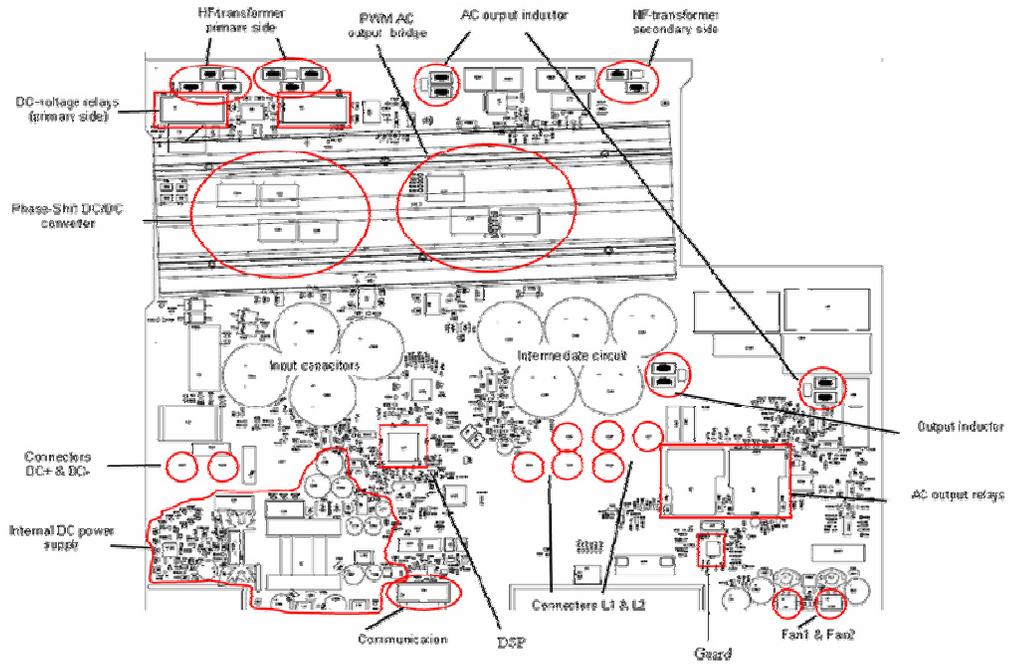
- STATE + triple-digit Code + Symbol
- 4 Service classes,
- State indicator: grid-generator-Fronius IG
- Message on the display as also via SMS / Fax / e-mail



Service messages

- **Serviceclass 1**
error in the grid – identified by Fronius IG
- **Serviceclass 3**
short-term internal error, → **automatical adjustment!!!**
(z.B. at STATE 301, 302, 306, 307)
- **Serviceclass 4**
hard- or software-error
- **Serviceclass 5**
only messages – feeding operation will not interrupted!
(z.B. STATE 502 – isolation error PV-generator)

4 Board Exchange



5 Hidden Menues

„Hidden“ Menu

Some problems can be solved by a simple change of settings in the service menu.

Code:
XXXXXX



„Hidden“ Menu

- Country Setup Menu
- Installers Menu “basic”
- Installers Menu “profi”
- Errorcounter



Hidden“ Menu



- **Country Setup Menu**

Country specific Setup can be changed on site



„Hidden“ Menu

- **Installers Menu “basic”**

- Deactivation of Isolation warning (STATE 502)
- Activation of Grounding fuse
- GND Mode (OFF / NEG / POS)

- Set UDC Fix value
- FIX / MPP Mode



**For Thinfilm or
backside contacted Solar
modules**

Especially for Service purposes:

- Reset min/max value in TOTAL menu
- Masterchange at inverters with more powerstacks (Fronius IG Plus 70 – 150)

„Hidden“ Menu

- **Installers Menu “profi”**

Code will be required once

- Setup values (U min/max, f min/max) adjustable
- Adjustable Disconnection value for 10 min. average value
- Grid connection time at Firststart
- Grid Reconnection time after Disconnection



Source: www.lan-ge.de/deutsch/fotos.htm

„Hidden“ Menu

- **Errorcounter:**

1. STATE 112 Grid-Over/Undervoltage L1
2. STATE 122 Grid-Over/Undervoltage L2
3. STATE 132 Grid-Over/Undervoltage L3
4. STATE 301 AC Over Current
5. STATE 304 Overtemperature
6. STATE 425 Communication Error on Powerstack

[ENTER]

CLEAR (ED) Reset the Counter

