

High Voltage Pulse Generator FPG 20-10NKN5

Operation Manual



FDS 20-10NKN5 Operation manual

OVERVIEW

High voltage pulse generator FPG 20-10NKN5 (the Generator) is designed to produce voltage pulses with maximum amplitude of up to 20 kV into 200-500 Ohm load. Operation of the FPG 20-10NKN5 should be carried out according to this Operation Manual. The operator should study this Operation Manual prior to using of the FPG 20-10NKN5.

DISCLAIMER

This Generator contains high voltage power supplies, careless use could result in electric shock. It is assumed that this highly specialized equipment will only be used by qualified personnel. FID GmbH accept no responsibility for any electric shock or injury arising from use or misuse of this equipment, as well as for the consequences of the Generator operation with a user's equipment. It is the responsibility of the user to exercise care and common sense with this highly versatile equipment.

TRANSPORTATION

Transportation of the Generator should be performed with a complete disconnection from all power sources. The Generator should be transferred in a specialized container, protecting it from possible shocks during the transportation.

UNPACKING

Having received the package with the Generator, put it into the horizontal position as labeled on the package. Remove the transportation packing from the package and after that remove the Generator. Make sure that the Generator has no visible mechanical damage. If the packing material was damaged during shipping, please take a photo of the damaged packing and its contents and send it to FID GmbH or its representative immediately upon receiving the package.

LIMITED EXPRESS PRODUCT WARRANTIES

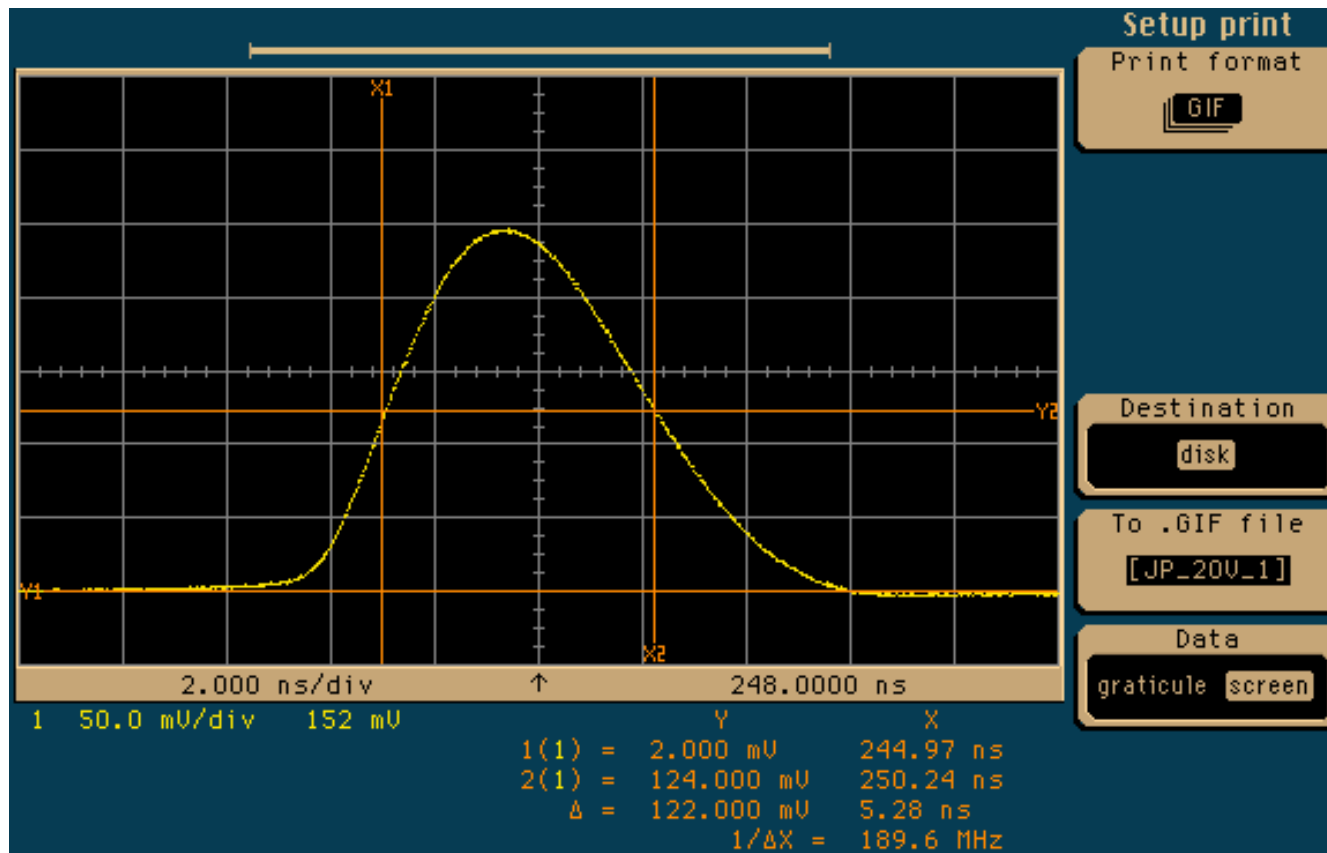
All Products are warranted to Buyer against defects in materials and workmanship for the period of time of 12 months. FID shall, at its option, repair or replace any Product that proves, in the reasonable opinion of FID, to be defective in materials or workmanship during the warranty period. All Products repaired or replaced under warranty are only warranted for the remaining un-expired period of time in the original warranty for the particular defective Product. FID reserves the right to issue a credit note for any defective Products that have proved effective through normal usage. **THIS WARRANTY EXCLUDES PRODUCTS, PARTS OR EQUIPMENT THAT HAVE BEEN ACCIDENTALLY DAMAGED, DISASSEMBLED, MODIFIED, MISUSED, OR WHICH ARE USED IN APPLICATIONS THAT EXCEED THEIR SPECIFICATIONS OR RATINGS, NEGLECTED, IMPROPERLY INSTALLED OR OTHERWISE ABUSED.** Buyer must claim under the warranty in writing no later than 30 days after the claimed defect is discovered. This warranty does not extend to any third party, including without limitation Buyer's end-users or customers, and does not apply to any parts, equipment or other goods not manufactured by FID. **EXCEPT FOR THE LIMITED WARRANTIES EXPRESSLY SET FORTH ABOVE, FID SPECIFICALLY DISCLAIMS ANY AND ALL OTHER WARRANTIES TO BUYER, INCLUDING WITHOUT LIMITATION, ANY AND ALL IMPLIED WARRANTIES, SUCH AS FREEDOM FROM INFRINGEMENT, MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.**

FDS 20-10NKN5 Operation manual**SPECIFICATIONS**

Maximum amplitude into 200-500 Ohm or 10 pF	- 20 kV
Peak current	- 100 A
Output connector	- FC19/50-PM (custom FID GmbH type)
Rise time	- 2 ns
Pulse duration at 50%	- 5 ns
Maximum PRF	- 10 kHz
Triggering	- Internal and external 5 V, 100 ns
Input power	- AC 100-240 V
Dimensions	- 480x400x120 mm

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FPG 20-10KN5 PULSE SHAPE



Maximum amplitude 20 kV

OPERATION METHODOLOGY

Generator FPG 20-10NKN5 is designed to operate with a 200-500 Ohm load. All technical specifications such as voltage amplitude, rise time, pulse duration are provided at the above mentioned particular load of 200-500 Ohm.

But practically the real load always differs from 200-500 Ohm value either way because of capacitance of inductance, non-linear effects and other things connected with a particular load.

The FPG 20-10NKN5 is capable of operating in fail-free mode even if the load's impedance differs from the nominal 200-500 Ohm for +/- 80%.

The higher is the level of variation of the impedance, the smaller amount of energy is consumed by the load. In this case there appear reflected from the load repetitive voltage pulses and almost all energy of the initial pulse is absorbed inside the FPG 20-10NKN5. This induces a significant heating-up of various internal structures of the generator and may lead to the Generator failure.

In any case when the load for the FPG 20-10NKN5 differs from 100-1000 Ohm it is necessary to discuss the modes of operation of the FPG 20-10NKN5 with FID GmbH.

The most important condition of a safe operation of the FPG 20-10NKN5 is the tolerance of the surrounding electronic equipment to the electro-magnetic interference. Usually the source of such interference is the load, as the FPG 20-10NKN5 has two screening layers. The experience in operation of the similar pulse generators shows that users' DC power supplies and triggering generators often do not comply with increased electro-magnetic interference level. Such instability can lead to loss of power supply stabilization and spontaneous triggering of the trigger generators at frequencies higher than 10 kHz. Any of these in its turn could lead to the FPG 20-10NKN5 breaking.

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INSTALLATION

1. Put the Generator blocks into the horizontal position and make sure that the Generator blocks have no visible mechanical damage.
2. Using the included transmission line connect the matched load to the Generator's output connector. The load should be connected by the cables with minimum inductance possible to avoid pulse reflection back to the Generator and presence of after-pulses.

Connectors should be clear of any dirt. Wipe them with a soft cloth and apply silicon insulating grease before assembling the connector.

3. Connect the AC 110-240V power cord to the terminal on the rear panel of the Generator and connect them to mains power.
4. If necessary connect the external triggering source to connector labeled "TRIGGER" on the rear panel of the Generator.

Attention!!!

The triggering generator should be capable to withstand high frequency electromagnetic interference. Malfunction of the triggering generator may lead to damage of the FPG 20-10NKN5

OPERATION MODES

The Generator can operate in two triggering modes – using internal triggering circuit and using the user's triggering pulser. For the requirements to the external triggering pulser please see sections SPECIFICATIONS and INSTALLATION.

FID GmbH recommends to perform the initial testing of the FPG 20-10NKN5 using internal triggering mode.

OPERATING FPG 20-10NKN5

1. Check if the Generator is properly connected (see section INSTALLATION)
2. Put “MODE” switch on the rear panel to “EXT” position.
3. Turn on the “POWER” switch of the front panel. The cooling fans inside the Generator should start operation.
4. To start pulse generation
 - 4.1. in internal triggering mode – put “MODE” switch to “INT” position
Pulse repetition rate can be adjusted by a knob on the rear panel labeled “FREQUENCY”
 - 4.2. in external triggering mode – apply external triggering pulses
5. Adjust amplitude using the knob on the rear panel.
6. Turn off in reverse order

Attention!!!

In external triggering mode never exceed maximum PRF of 10 kHz