



GPS-3000 Series

Triple-Output Regulated DC Power Supplies

GPS-3303D · GPS-3306D · GPS-3603D

User Manual

Part numbers 560214, 560355 and 560678 · Issue 1

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1 Safety

Read this section before connecting the instrument. Every item in it is here because ignoring it can injure you or destroy what you are working on.

- Use the supplied three-core mains lead and make sure the instrument is earthed. Do not defeat the earth connection.
- Do not exceed the rated output of any channel. Do not short output terminals together while a channel is delivering current.
- Place the instrument on a level surface in free air and keep the ventilation clear.
- Do not use the instrument above 40 °C, in a damp atmosphere, or where flammable or corrosive material is stored.
- There are no user-serviceable parts inside. Disconnect the mains lead and return the instrument to GPS or to a qualified engineer if it behaves abnormally.

In series mode CH1 and CH2 are linked internally and the pair floats as one supply. Earth at most one point of that pair. Connecting an earthed instrument, an oscilloscope for example, to the wrong terminal will short a channel through the earth path.

On the GPS-3603D, series mode reaches 120 V. Treat the terminals as a shock hazard, use leads rated for it, and switch the output off before changing any connection.

Set the tracking switches with the OUTPUT switch off. Changing mode with a load connected reconfigures the internal connection between CH1 and CH2 while current is flowing.

2 Introduction

This manual covers the three triple-output supplies in the GPS-3000 series: the GPS-3303D, the GPS-3306D and the GPS-3603D. Each has two identical adjustable channels and a separate low-voltage rail for logic, and all three are operated the same way.

The two adjustable channels can run independently, in series to give twice the voltage or a matched positive and negative supply, or in parallel to give twice the current. The mode is set by two rocker switches on the front panel, and in either tracking mode CH1 is the master: its controls set both channels.

The third rail differs between models. On the GPS-3303D it is adjustable from 2.2 to 5.2 V at 1 A; on the GPS-3306D and GPS-3603D it is fixed at 5 V and 3 A, which suits TTL logic directly.

Output voltage and current are continuously adjustable from zero to the rated value on each adjustable channel, and each crosses over between constant voltage and constant current operation automatically according to the load.

The single-output models in this series are covered by a separate manual.

Voltage and current can be set with the output disabled, before anything is connected. Doing so avoids drawing an arc at the terminals when the load is attached, as well as protecting the load from a setting left over from the last job.

3 Specification

Figures apply after thirty minutes of operation at an ambient temperature of $20\text{ }^{\circ}\text{C} \pm 5\text{ }^{\circ}\text{C}$.

Outputs, by model

Model	CH1 and CH2	CH3	Series	Parallel
GPS-3303D	0 to 30 V, 0 to 3 A	2.2 to 5.2 V, 1 A	0 to 60 V	0 to 6 A
GPS-3306D	0 to 30 V, 0 to 6 A	5 V, 3 A	0 to 60 V	0 to 12 A
GPS-3603D	0 to 60 V, 0 to 3 A	5 V, 3 A	0 to 120 V	0 to 6 A

The three outputs are isolated from each other and from the chassis. CH3 is unaffected by the tracking switches and has its own voltage control and overload lamp.

Common to the instrument

Item	Specification
Line regulation, CV	Not more than $1 \times 10^{-4} + 3\text{ mV}$
Load regulation, CV	Not more than $1 \times 10^{-4} + 3\text{ mV}$ at up to 3 A, not more than $2 \times 10^{-4} + 3\text{ mV}$ above 3 A
Ripple and noise, CV	Not more than 1 mV rms, 5 Hz to 1 MHz
Line and load regulation, CC	Not more than $2 \times 10^{-3} + 3\text{ mA}$
Ripple, CC	Not more than 1 mA rms
Series tracking	Line not more than $1 \times 10^{-4} + 5\text{ mV}$, load not more than 300 mV
Parallel tracking	Line and load as for constant voltage
CH3 regulation	Line not more than 5 mV, load not more than 15 mV, ripple not more than 2 mV rms
Meters	Two pairs of three-digit LED • precision $\pm(0.5\% \text{ of reading} + 2 \text{ digits})$
Protection	Adjustable current limit, short circuit, CH3 overload lamp
Insulation	Chassis to terminal not less than 20 M Ω at 500 V DC
Mains input	220 V $\pm 10\%$, 50/60 Hz, switch selectable
Operating conditions	0 $^{\circ}\text{C}$ to 40 $^{\circ}\text{C}$, relative humidity below 80%
Storage conditions	-10 $^{\circ}\text{C}$ to 40 $^{\circ}\text{C}$, relative humidity below 70%
Dimensions and mass	280 $\times$ 255 $\times$ 145 mm (w $\times$ d $\times$ h), 7.0 kg
Part numbers	GPS-3303D 560214 • GPS-3306D 560355 • GPS-3603D 560678

4 Front panel

POWER

Mains switch. Pressed in is on. The meters light when the instrument is powered.

OUTPUT

Disconnects all terminals from the regulators without switching the instrument off, so voltage and current can be set and read on the meters before anything reaches the load.

CURRENT and VOLTAGE, one pair per adjustable channel

A voltage control and a current control for CH1 and for CH2. The current control sets the limit at which the channel crosses over to constant current. In series or parallel mode the CH1 pair sets both channels and the CH2 controls have no effect.

C.V., C.C. and PAR. lamps

Show the state of each adjustable channel: constant voltage, constant current, or following the master in parallel mode.

TRACKING switches

Two rockers, with the required position of each printed beside them. See section 5.

CH1 / CH3 meter select

A switch above the right-hand meter pair, choosing whether those meters read CH1 or CH3. The left-hand pair always reads CH2.

CH3 VOLTAGE and OVER LOAD CH3

A control for the logic rail, adjustable from 2.2 to 5.2 V on the GPS-3303D and fixed on the other two, with a lamp that lights when the rail is overloaded. If it lights, reduce the load until it goes out: an overloaded rail drops in voltage and current and will not power the circuit properly.

Output terminals

Negative and positive for each of CH2, CH1 and CH3, with a central ground post. The outputs float: none is connected to earth unless you link it to that post.

5 Tracking modes

The two rocker switches select how CH1 and CH2 are connected. Each mode is printed on the panel as a pair of pictograms showing the position of each switch, tall for out and flat for in.

Mode	Left switch	Right switch	Result
Independent	Out	Out	Three separate supplies
Series	In	Out	CH1 and CH2 in series, double the voltage
Parallel	In	In	CH1 and CH2 in parallel, double the current

Independent

Three separate supplies, each isolated. Set each channel with its own controls.

Series

The positive terminal of CH2 is connected internally to the negative terminal of CH1, and both channels follow the CH1 controls. Taken across the outer pair, the negative of CH2 to the positive of CH1, you get double the rated voltage: 60 V on the GPS-3303D and GPS-3306D, 120 V on the GPS-3603D. The voltage across the pair is double the displayed value; the current is the value the meters show.

Taken either side of the junction, with that junction as the common, you get a matched positive and negative supply, which is what an operational amplifier circuit wants.

Double the rated voltage is available across the pair in series, up to 120 V on the GPS-3603D. Treat the terminals accordingly and earth at most one point.

Parallel

Both switches in. The positive and negative terminals of CH1 are connected internally to those of CH2, and both channels follow the CH1 controls. The CH1 meters read the actual output voltage and double the rated current is available: 6 A on the GPS-3303D and GPS-3603D, 12 A on the GPS-3306D.

6 Operation

Setting a voltage

Switch on with the OUTPUT switch off, set the voltage on the meter, connect the load and enable the output.

Setting a current limit

Set the voltage first with the output off. Short the channel's output terminals with a lead rated for the current you intend to draw, enable the output, and turn the CURRENT control until the ammeter reads the limit you want. The C.C. lamp will be lit. Disable the output, remove the short and connect the load.

The channel now behaves as a voltage source up to that current and as a current source beyond it. This is what protects a load you are unsure of: set the limit a little above the expected current and a fault draws the limit rather than whatever the supply can deliver.

Using the logic rail

CH3 is set with its own control and is not affected by the tracking switches. If the OVER LOAD CH3 lamp lights, reduce the load on it.

7 Care and maintenance

- Clean the case with a damp cloth and a mild detergent. Do not use solvents or abrasives.
- Keep the ventilation clear and blow accumulated dust out periodically with dry air.
- If the instrument is to be stored for a long period, disconnect the mains lead and keep it dry.
- Recalibration and repair are available from GPS. Contact us with the model and part number.

8 Supplied with the instrument

- GPS-3303D, GPS-3306D or GPS-3603D triple-output regulated DC power supply
- Mains lead
- This manual

Test leads, rack mounting and calibration are available separately. The declaration of conformity is supplied with any quotation on request.

9 Warranty

One year from the date of purchase, subject to product registration with GPS. The warranty covers defects in materials and workmanship and does not cover damage caused by operation outside the rated conditions, by unauthorised repair, or by connection to a supply outside the stated input range.

For service, calibration or technical support contact GPS at sales@gpslimited.com or +44 (0) 203 093 0914.