

ISO-TECH IPS1810H and IPS1603D
DC power supply
ISO-TECH IPS 1810H et IPS 1603D
Alimentation électrique c.c.

ISO-TECH IPS 1810H 204-713

ISO-TECH IPS 1603D 204-729

82IP-1810HME

Statement of Compliance

IPS 1810H and IPS1603D

is herewith confirmed to comply with the requirements set out in the Council Directive on the Approximation of the Law of Member States relating to Electromagnetic Compatibility (89/366/EEC, 92/31/EEC, 93/68/EEC) and Low Voltage Equipment Directive (73/23/EEC). For the evaluation regarding the Electromagnetic Compatibility and Low Voltage Equipment Directive, the following standards were applied:

EMC Directive 89/366/EEC amended by 92/31/EEC; 93/68/EEC	
EN 50081-1 (1992): Electromagnetic Compatibility- Generic Emission Standard. Part 1: Residential, Commercial and Light Industry Conducted and Radiated Emissions EN 55022 class B (1994)	EN 50082-1 (1992): Electromagnetic Compatibility- Generic Immunity Standard. Part 1: Residential, Commercial and Light Industry Electrostatic Discharge IEC 1000-4-2: 1995
Current Harmonic EN 61000-3-2 (1995)	Radiated Immunity IEC 1000-4-3: 1995
Voltage Fluctuation EN 61000-3-3 (1995)	Electrical Fast Transients IEC 1000-4-4: 1995
	Surge Immunity IEC 1000-4-5: 1995 Voltage Dips / Interrupts EN 61000-4-11: 1994
EN 50081-2 (1993): Electromagnetic Compatibility- Generic Emission Standard. Part 2: Industrial Environment Conducted and Radiated Emissions EN 55011 class B (1991)	

Low Voltage Equipment Directive 73/23/EEC
Safety Requirements EN 61010-1: 1995

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1. Introduction

The IPS1810H and IPS1603D regulated DC power supplies have been designed to provide the features most often required in the Laboratory, school and production environments. Output voltages and currents of both supplies are continuously adjustable over their respective specified ranges. Coarse and fine potentiometers control the voltage and current outputs while the respective analogue and digital displays accurately indicate the output.

The stability of the IPS1810H and IPS1603D has been ensured by some cleverly designed circuitry that also reduces ripple and noise voltages to a minimum (typically less than 1mV rms (5Hz~1MHz)). Operation of the unit can be achieved in either constant voltage or current modes, the mode being indicated by a coloured LED. Further details of the operational modes are described in section 4 “Operating Instructions”.

Both the IPS1810H and IPS1603D can be connected in series and parallel to other ISO-TECH power supplies to increase their total output.

2. Specifications

2.1 General

Main supply

100V/120V/220V/230V \pm 10% 50/60Hz (switch selectable)

Type	Model	Max. Rating		Input Rating		Fuse type and Rating		Weight (kg)
		Volts(V)	Amps(A)	Watts	VA	100V/120V	220V/230V	
Analog	IPS1810H	18	10	390	480	T 6.3A 250V	T3.15A 250V	11.5
Digital	IPS1603D	60	3	360	450			11.5

Dimensions

255(W) x 145(H) x 355(D) mm

Operation mode

Series operation

Operation temperature and humidity

0°C to 40°C, <80%

Storage temperature and humidity

10°C to 70°C < 70%

Maximum Altitude

2000m

Installation Category

II

Pollution Degree

2

Product designed for indoor use only.

Accessories

T3.15A HRC Fuse x 1

Test leads x 1

Operation manual x 1

2.2 Constant Voltage Operation

- i) Output voltage ranges 0 to maximum rated voltage continuously adjustable
- ii) Voltage regulation
 - line regulation * 0.01%+3mV
 - load regulation * 0.02%+5mV
- iii) Recovery time * 100.s
- iv) Temperature coefficient * 300ppm/°C
- v) Ripple & Noise*1mVrms(5Hz~1MHz)-typical value.

2.3 Constant Current Operation

- i) Output current range 0 to maximum rated current continuously adjustable.
- ii) Current regulation
 - line regulation * 0.2%+3mA
 - load regulation * 0.2%+3mA
- iii) Ripple current * 3mA rms – typical value.

2.4 Indicator meter

- i) Digital type
 - Display: 3¹/₂ Digits 0.5” Red LED Display
 - Accuracy: ±(0.5% of rdg + 2 digits)
 - Voltage range: 19.99V of full scale (rated voltage * 18V)
199.9V of full scale (rated voltage] 20V)
 - Current range: 19.99A of full scale
- ii) Analogue type
 - Meter: Voltage and Ammeter each one
 - Class: 2.5
 - Dimensions: 60×80 mm

2.5 Insulation

- >20M. @ 500VDC between chassis and outputs.
- >100M. @ 500VDC between live parts and earth.

2.6 Symbols Description



Indicates where cautionary or other information is found in the manual



Fuse

Danger High Voltage



Danger Hot Surface



Protective Ground Terminal



Functional Earth Terminal

3. Panel controls and Indicators

3.1 Front panel (see figures 3-1 and 3-2)

- | | |
|----------------------------|--------------------------------------------------------------------------------|
| (1) CV indicator-green LED | lights when the power is turned on and in constant voltage mode. |
| (2) CC indicator-red LED | lights when in constant current mode. |
| (3) Voltage coarse | for the coarse adjustment of the output voltage. |
| (4) Voltage fine | for the fine adjustment of the output voltage. |
| (5) Current coarse | for the coarse adjustment of the output current. |
| (6) Current fine | or the fine adjustment of the output current. |
| (7) "+" output terminal | positive polarity. (Red) |
| (8) "GND" terminal | Earth and chassis ground (Green) |
| (9) "-" output terminal | negative polarity. (Black) |
| (10) Voltmeter | Indicates the output voltage (digital meter IPS1603D, analogue meter IPS1810H) |
| (11) Ammeter | Indicates the output current (digital meter IPS1603D, analogue meter IPS1810H) |
| (12) Power control | on/off switch |

3.2 Rear panel (see figure 3-3)

(13) Fuse holder

(14) Power cord

(15) HI-LO switch

(16) AC selects switch

(Fuse type: T3.15A HRC Fuse 220V/230V. T6.3A HRC Fuse 100V/120V)

HI position selects high voltage range (120V, 230V AC inputs),

LO position selects low voltage range (100V, 220V AC inputs)

With (15) HI-LO switch selects to permit operation of 100, 120, 220 or 230VAC, 50/60Hz line voltages

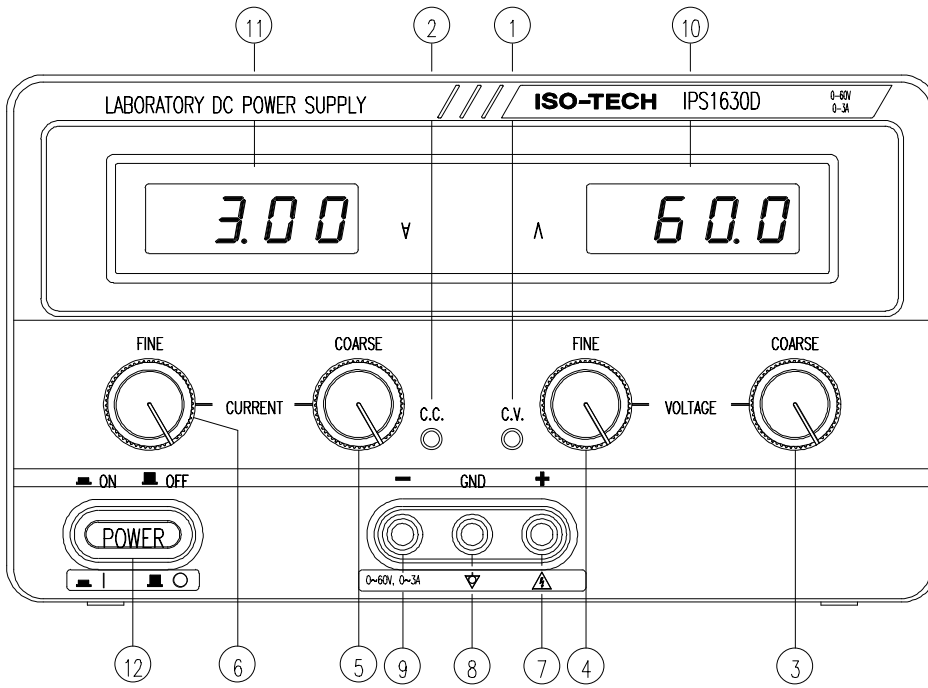


Figure 3-1 (Front Panel—IPS1603D)

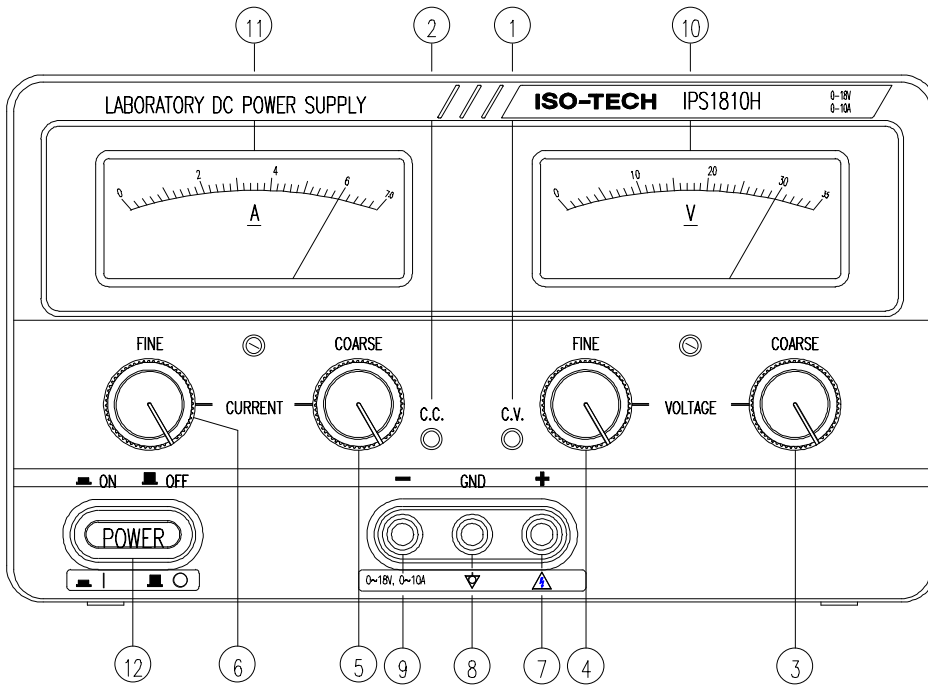


Figure 3-2 (Front Panel—IPS1810H)

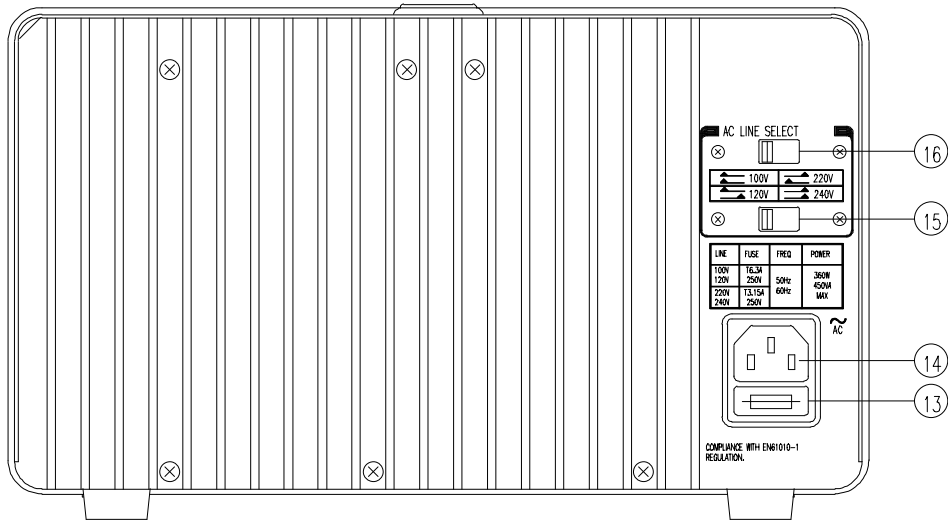


Figure 3-3 (Rear Panel)

4. Operating Instructions

4.1 Precaution

- i) AC input should be within the range of line voltage $\pm 10\%$ 50/60Hz
- ii) When installing the power supply in a place where the ambient temperature exceeds 40°C ensure that the heat sink located at the rear of the supply has sufficient air space for radiation.
- iii) Voltage Overshoot
Ensure that the voltage between the output terminals never exceeds the preset value when the power is turned on.

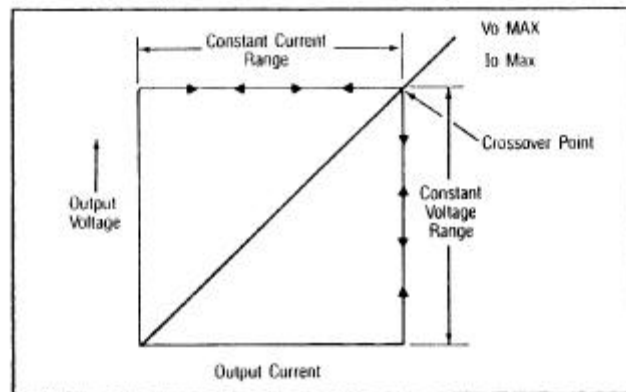


Fig. 4-1 Constant Current Characteristic

Voltage/Constant

4.2 Constant Voltage/Current

Both the IPS1810H and IPS1603D power supplies have constant voltage constant current automatic crossover characteristics that permit a continuous transition between constant current and constant voltage modes in response to a change in the load. The intersection of constant voltage and constant current modes is called the crossover point and is shown in Figure 4-1. For example, if the load is such that the power supply is operating in the constant voltage mode, a regulated output voltage is provided. The output voltage remains constant as the load increases, up until the point where the preset current limit is reached. At that point, the output current becomes constant and the output voltage drops in proportion to further increases in load. The crossover point is indicated by the front panel LED indicators. The crossover point is reached when the green CV indicator goes off and the CC indicator comes on. A crossover will similarly occur with a

Characteristics

decrease in the load when operating in the constant current mode. When a demand for the full current is no longer required then a crossover to the constant voltage mode occurs.

4.3 Setting Current Limit

- i) Determine the maximum safe current for the device to be powered to.
- ii) Ensure the power supply is off and that both the current and voltage dials are turned fully anti-clockwise.
- iii) Temporarily short the (+) and (-) terminals of the power supply with a test lead for example.
- iv) Turn the power supply on and rotate the coarse voltage control away from zero sufficiently for the red CC LED to light.
- v) Adjust the current control for the desired current limit. The value will be displayed on the Ammeter.
- vi) The current limit (overload protection) has now been preset and so the current control should not be moved from this position.
- vii) Switch the power supply off and remove the short from between the (+) and (-) terminals. Now connect the load to the binding posts.

4.4 Operating mode

When using the supply on its own the following procedure should be followed.

- i) Set the power switch on the power supply to the "OFF" position.
- ii) Plug the mains power lead into the back of the power supply.
- iii) Ensure that the line voltage is correct for the input power voltage.
- iv) Switch the power supply on with the power switch at the front left hand corner of the supply.
- v) Adjust the "voltage" and "current" to the desired level.
- vi) Switch the supply off before connecting the load to the binding posts. Make sure that the correct polarities (+) and (-) are observed on connection of the load.
- vii) Switch the power supply on.

4.5 Series operation

When higher voltage and current outputs are required the IPS1810H and IPS1603D can be connected in both series and parallel modes. Connected in series, the voltage of both supplies are combined to give an output voltage variable over the range from 0 to the maximum combined voltages. Load current may be set on either of the supplies but since the supplies are connected in series then only one of the dials need be set. Figure 4-2 shows the connection required for series operation.

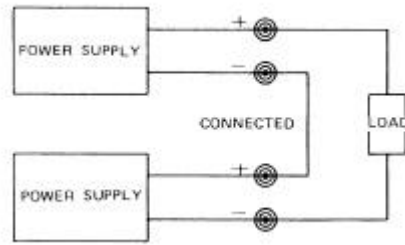


Fig. 4-2 Connecting Two Power Supplies in Series

5. Maintenance

5.1 Fuse Replacement

If the mains fuse fails, then the power supply will not operate. The fuse holder positioned at the rear of the supply should not normally be opened unless the supply fails to operate. Try to determine the cause of the blown fuse, then replace only with a fuse of the correct rating and type. Fuse type: - T3.15A HRC FUSE (220V/230V), T6.3A HRC FUSE (100V/120V)

5.2 Line voltage conversion

The IPS1810H and IPS1063D can operate under different line voltages which are tapped from the transformer to permit operation from 100, 120, 220 or 230VAC, 50/60Hz line voltages. Conversion from one line voltage to another is done by changing the AC selector switch as shown in figure 3-3. The rear panel will be currently set to operate for UK mains - 240VAC 50Hz line voltage

To convert to a different voltage follow the following procedure:-

- i) Ensure the power cord is unplugged
- ii) Change the AC selector to the desired line voltage
- iii) A change in AC line voltage may also require a corresponding change of fuse value.

5.3 Warning:

Do not attempt to open the power supply unless qualified to do so. Ensure that all power to the unit has been isolated before proceeding. If this unit does fail to operate then consult qualified service personnel only.