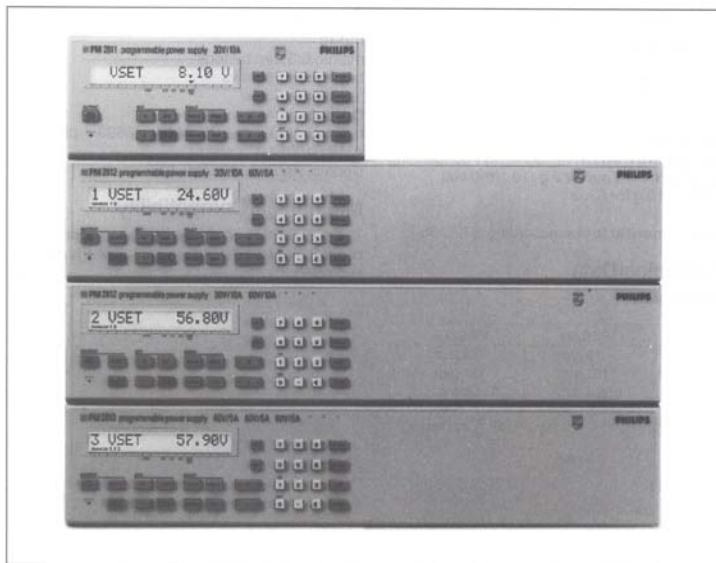


Power Supplies

Programmable Power Supplies



PM2800 Family of Programmable Power Supplies

Single, Dual and Triple Output Versions
60 W or 120 W output power options
Autoranging Power Modules for Maximum Versatility with voltage and Current (PM 2811, PM 2812 & PM 2813 series).
New Linear Power Modules for Current source/sink Capability (PM 2831 & PM 2832 series).
GPIB/IEEE-488.2 interface with SCPI protocol for easy programming
Internal memory stores 99 Voltage & Current settings
Built-in metering (readback) for Voltage and Current
Constant Voltage, Constant Current, OverVoltage/OverCurrent protection modes

The Fluke/Philips line of Programmable Power Supplies was created with the test builder in mind. The GPIB/IEEE interface, output power module and output metering facilities are built in, taking up only 2 engineering units of rack height. The full rack width models come equipped with rack mount ears for easy installation in a standard 19" rack.

We have not forgotten the bench user. The front panel allows full access to all instrument functions, including voltage and current readback. A sequence of front panel settings can be created with the AUTOSTEP mode, quickly creating an automated test pattern of user-defined voltages and currents with no need for a controller.

The optional front panel output gives the user

easy access to both the power output connections and the sense lines; great for prototyping and temporary set-ups.

Versatile Power

Fluke and Philips now offer two types of power modules:

Autoranging power modules for superior current and voltage versatility.

The PM 2811, PM 2812 and PM 2813 offer autoranging in 60 W and 120 W up to 180 W per mainframe (see page 14 - 16 for more details).

Linear power modules for current source/sink capability. The new PM 2831 and PM 2832 family offers linear power modules from 120 W up to 240 W per mainframe (see page 14 - 17 for more details).

Extending the Power range

Power supply outputs can be connected in series to obtain higher voltages and in parallel to obtain higher currents.

Each output is independently programmable and isolated from other outputs. Each output is electrically isolated up to 240 Vdc.

Voltage source or Current source

The power supply can act either as voltage source or as current source, depending on the load conditions and the selected values of voltage and current.

Versatile Programming

Every model comes equipped with the GPIB/IEEE-488.2 interface which supports the Standard Commands for Programmable Instruments (SCPI).

By conforming to this industry standard in programming, the task of creating and supporting application programs is made easier.

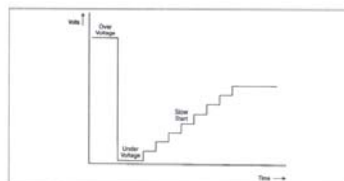
```
volt 12.34
MEAS: VOLT?
MEAS: CURR?
```

The front panel interface is more than just a readback facility. From the front panel the user can access all of the functions that are implemented in GPIB. For example, the SRQ mask which determines power supply conditions will generate an interrupt to the GPIB controller, is easily programmed either remotely or by front panel prompts.

Internal memory & Autostep.

Up to 99 settings of voltage and current can be stored and recalled from the internal non-volatile memory (valid per output!). The last instrument settings are automatically stored on power down.

The STEP function allows the voltage and current settings stored in the internal memory to be recalled successively, and to be activated if the supply is in Operated Mode, by pressing a single key. A repetitive pattern can be created using AUTOSTEP to sequence front panel settings at a user-defined rate.



The figure shows a voltage pattern for testing over and undervoltage and slow start-up to a device under test, using AUTOSTEP.

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Programmable Power Supplies

The power supplies are equipped with external triggerlines which can be used to recall voltage and current settings from the internal memory. This allows accurate synchronization with other equipment and results in less GPIB traffic.

Extensive Protection features

To protect your device under test, an extensive set of protection features has been included. OverVoltage and OverCurrent limit values can be set by the user. When a limit value is reached, power is removed from the outputs within only a few milliseconds.

Voltage and Current are constantly monitored by a separate readback circuit with its own sense lines for measuring voltages directly at the load. A programmable delay feature allows protection to ignore short term overloads, such as current surges during a turn-on sequence. The Coupled Protection feature ensures that an overload in one output will shut down all other outputs, simultaneously, an important feature for applications requiring positive and negative balanced voltages such as operational amplifiers. The power supplies continuously monitor themselves for internal over-temperature conditions. Output power can be turned on and off using the Operate/Standby mode which can be selected with a front panel key or is programmable via the GPIB interface.

Easycalibration

Closed case calibration means the power supply does not have to be removed from the rack for calibration. A calibrated multimeter and a load are all that is required.

Access to the calibration mode is protected with a user-defined password.

Reliability you expect

Reliability of power supplies is of extreme importance. The Fluke/Philips programmable power supplies, with extensive internal self-monitoring device protection features and a generous amount of cooling, are designed for years of trouble-free service.

Specifications

General Specifications

Safety

IEC-348, class 1; VDE 0411
CSA-C22.2 No. 231; UL 1244

EMC

Emission: VDE 0871; CISPR 11
Susceptibility: IEC 801

Environmental aspects

MIL-T-28800D, Type III, Class 5, Style E
Operating Temp.: 0°C...55°C (LCD: 0°C...50°C)
Storage Temp.: -20°C to +70°C

Supplemental Characteristics

Isolation: 240V above ground
Reprogramming delay: Up to 60 seconds

Dimensions

Height: (excl. feet): 87 mm (3,4.3 in)
Feet: 18 mm (0.71 in)
Width: For PM 2811 210 mm (8,2.7 in);
For PM 2812 and PM 2813 420 mm (16,5.4 in)
Depth: 381 mm (15.0 in)
Weight: For PM 2811: 5 kg (11 lb);
For PM 2812 and PM 2813: 9 kg (20 lb)
For PM 2831 9 kg (20 lb) and PM 2822 18 kg (40 lb)

Power Requirements

Line Voltage: 94V ac to 130V ac;
190V ac to 255V ac

Line Frequency: 50 or 60 Hz

Power Consumption:

PM 2811: 1.4A/110V, 0.8A/220V
PM 2812: 2.6A/110V, 1.4A/220V
PM 2813: 3.7A/110V, 2.0A/220V
at maximum load

Operator's manual and line cord included with instrument.

Ordering information

Autoranging Power Supplies			
Outputs & Models	30V 10A, 60W	60V 5A, 60W	60V 10A, 120W
Single			
PM 2811/01*	1	1	
PM 2811/11*		1	
Dual			
PM 2812/01*	2		
PM 2812/11*		2	
PM 2812/21*	1	1	
PM 2812/31*		1	1
PM 2812/41*		1	1
Triple			
PM 2813/01*	3		
PM 2813/11*		3	
PM 2813/21*	2	1	
PM 2813/31*	1	2	

Linear Power Supplies		
Outputs & Models	60V ±2A, 120W	120V ±1A, 120W
Single		
PM 2831/01*	1	
PM 2831/11*		1
Dual		
PM 2832/01*	2	
PM 2832/11*		2
PM 2832/21*	1	1

*3 = us version
4 = UK version
5 = Swiss version
1 = for all the countries

Accessories

PM 2392/01 Cable set for external trigger line.
PM 9280/031 Rackmount kit for PM 2811



Front Panel Connectors

These are available for any power supply in the PM 2800 family. This option is ordered factory installed only. The part number of each power supply ordered with front panel outputs must be modified.

Ordering information for the Front Panel Connectors

PM 2811/*5*
PM 2812/*5*
PM 2813/*5*
PM 2831/*5*
PM 2832/*5*

Example

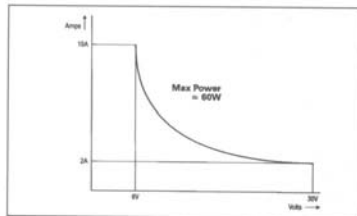
PM 2811/053: Single output, 30V/10A/60W with front panel connectors, 110V US version.

Power Supplies

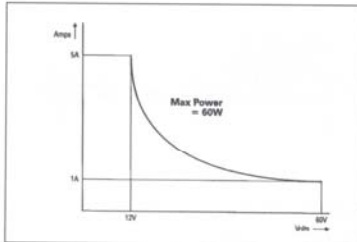
Programmable Power Supplies

PM2811/12/13 Autoranging Series Programmable Power Supplies

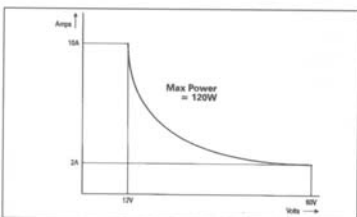
- Single, dual and triple output versions.
- 60W, 120W Power output options.
- Autoranging for maximum versatility with voltage & current



Autoranging Curve for 30 V / 10 V / 60W Power Module



Autoranging Curve for 60 V / 5 A / 60W Power Module



Autoranging Curve for 60 V / 10 A / 120W Power Module

Technical Specifications

OUTPUT	60W	60W	120W
Power	60W	60W	120W
Voltage	30V	60V	60V
Current	10A	5A	10A
Accuracy*	Autoranging	Autoranging	Autoranging
Voltage	0.04% + 10 mV	0.04% + 20 mV	0.04% + 20 mV
Current	0.1% + 50 mA	0.1% + 25 mA	0.1% + 50 mA
OVP	0.5% + 150 mV	0.5% + 250 mV	0.5% + 250 mV
PARD (DC..30 MHz)			
CV (pp/rms)	15 mV/3 mV	30 mV/6 mV	30 mV/6 mV
CC rms	10 mA	10 mA	10 mA
Source Effect*			
Voltage	0.01% + 2 mV	0.01% + 2 mV	0.01% + 2 mV
Current	0.02% + 2 mA	0.02% + 2 mA	0.02% + 2 mA
Load Effect*			
CV	0.01% + 5 mV	0.01% + 5 mV	0.01% + 5 mV
CC	0.02% + 5 mA	0.02% + 5 mA	0.02% + 5 mA
Drift			
Voltage	0.04% + 5 mV	0.04% + 5 mV	0.04% + 5 mV
Current	0.05% + 10 mA	0.05% + 10 mA	0.05% + 10 mA
Progr. Resolution			
Voltage	7.5 mV (12 bit)	15 mV (12 bit)	15 mV (12 bit)
Current	2.5 mA (12 bit)	1.25 mA (12 bit)	2.5 mA (12 bit)
OVP	7.5 mV (12 bit)	15 mV (12 bit)	15 mV (12 bit)
Readback U/I	12 bit	12 bit	12 bit
READBACK*			
Accuracy			
Voltage	0.05% + 25 mV	0.05% + 50 mV	0.06% + 30 mV
Current	0.1% + 30 mA	0.1% + 15 mA	0.2% + 50 mA
RESOLUTION			
To interface			
Voltage	7.5 mV	15 mV	15 mV
Current	2.5 mA	1.25 mA	1.25 mA
RESOLUTION			
To display			
Voltage	10 mV	10 mV	10 mV
Current	10 mA	10 mA	10 mA
DYNAMIC OPER.			
Setting band	$\Delta I = 1A^{**}$	$\Delta I = 0,5A^{***}$	$\Delta I = 0,5A^{****}$
Overshoot	± 50 mV	± 50 mV	± 50 mV
Recovery time	150 mV	150 mV	150 mV
	1 ms	2 ms	2 ms
Progr. response			
Up	0...30V/2A: 100 ms	0...60V/1A: 200 ms	0...60V/2A: 200 ms
Up (no load)	0...30V/0A: 50 ms	0...60V/0A: 100 ms	0...60V/0A: 100 ms
Down	30...1V/2A: 100 ms	60...1V/1A: 200 ms	60...1V/2A: 200 ms
Down (no load)	30...1V/0A: 250 ms	60...1V/0A: 500 ms	60...1V/0A: 500 ms
Remote sense			
Capability	> 0,25 V/lead	> 0,25 V/lead	> 0,25 V/lead

*all regulations are + or - the values listed ** (1...10A) *** (0.5...5A) **** (1...10A)