

# Sorensen XPF Series

350–840 W

## Dual Output DC Power Supply with Powerflex™

35–60 V

- PowerFlex design with parallel or series configuration gives variable voltage/current combinations **equivalent to 6 power supplies in one unit**
- Individual on/off switch per output
- Dual isolated outputs
- Coarse and fine voltage controls
- Simultaneous display of output voltage and current for each output



10–20 A

~ 115 230

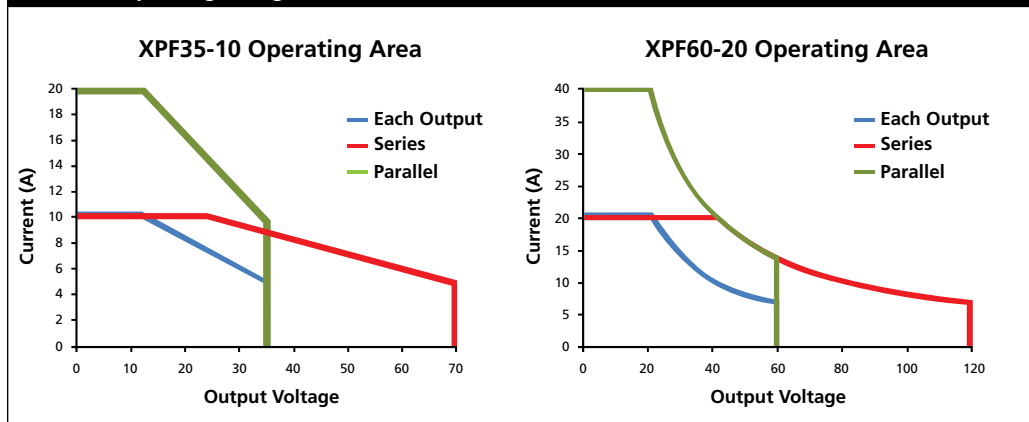
ETHERNET  LXI 

The Sorensen XPF is a new type of bench power supply designed to meet the need for flexibility in the choice of voltage and current. Typically, the maximum voltage and maximum current are not required simultaneously. The PowerFlex™ design enables higher currents to be generated at lower voltages within an overall power limit envelope. This is achieved by using the latest switch-mode technology.

The XPF Series are dual output DC power supplies with two completely independent and isolated outputs. If required, the outputs can be wired in series or parallel to achieve up to double the maximum voltage or double the maximum current.

The XPF60-20D has advanced digital features while keeping its simple to operate analog controls. The XPF60-20D also has a remote programming option making the popular XPF perfect for some ATE applications. The interfaces included: LXI Class C Ethernet, GPIB, USB and RS-232/423. Please see the last page of this XPF section for a full description of these advanced features

### PowerFlex Operating Configurations



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[www.SignalTestInc.com](http://www.SignalTestInc.com)  
 1529 Santiago Ridge Way  
 San Diego, CA 92154 USA.  
[Sales@SignalTestInc.com](mailto:Sales@SignalTestInc.com)

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# XPF Series : Product Specifications

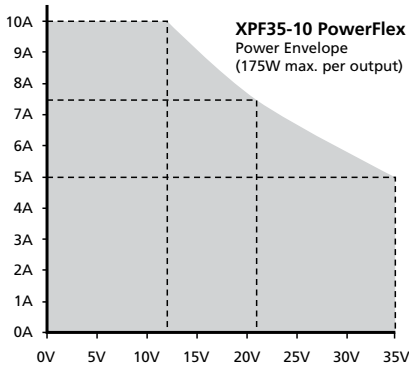
Output : Voltage and Current		
Models	35-10	60-20
Output Ratings (Each Output)		
Output Voltage	0 - 35 V	0 - 60 V
Output Current	0 - 10 A	0 - 20 A
Outputs	2	2
Output Power	up to 175 W (See PowerFlex envelope graph)	up to 420 W (See XPF 35-10 and XPF 60-20 PowerFlex power envelope graph)
Output		
OVP Range	10% -110% of maximum output voltage	
Voltage Setting	By coarse and fine controls	
Current Setting	By single logarithmic control	
Output Impedance	Typically <5mΩ in constant voltage mode. Typically >5kΩ in constant current mode (voltage limit at max.)	
Line Regulation	<0.01% of max. output for a 10% line voltage change	
Load Regulation	<0.05% of max. output for a 90% load change.	
Ripple and Noise	5 mV rms max, typically 2 mV rms, <20 mV pk-pk, (20 MHz bandwidth) both outputs fully loaded (7A @ 25V), CV mode (XPF 35-10) Typically <1mV rms, <10mV pk-pk, (20 MHz bandwidth) both outputs loaded (10A @ 42V) CV mode (XPF 60-20)	
Transient Response	<2ms to within 100mV of set level (XPF 35-10) and <250μs to within 50 mV of set level (XPF 60-20) for 90% load change	
Temperature Coefficient	Typically <100ppm/°C	
Output Protection	Forward protection by OVP trip; maximum voltage that should be applied to the terminals is 50 V for XPF35-10 and 70V for XPF60-20. Reverse protection by diode clamp for reverse currents up to 3A.	
Status Indication	LED indication of Output On, CV, CI and Power Limit. Message on display for over-voltage trip	
Output Switch	Push-push switch operating electronic power control. Preset voltage and current are displayed when the output is off	
Output Terminals	4mm terminals on 19mm (0.75") pitch. 15 A max. rating (XPF 35-10) and 30 A max. rating (XPF 60-20)	
Sensing	Remote sensing via a front panel terminal block or local sensing (at output terminals). Selection by slide switch	
Meter Type	Dual 4 digit meters with 12.5mm LEDs. Read rate 4Hz.	
Meter Resolution	10 mV, 10 mA	
Meter Accuracy		
Voltage	0.2% ± 1 digit	
Current	0.5% ±1 digit	
Input		
AC Input	XPF35-10: 110V-120V AC or 220V-240V AC ± 10% (adjustable internally, option HV for factory set 220-240 VAC input) 50/60 Hz . XPF60-20: 115V-240VAC ±10%, 50/60Hz. Installation Category II.	
Environmental		
Operating Temperature	Indoor use at altitudes up to 2000m, Pollution Degree 2	
Storage Temperature	-40 °C to + 70 °C	
Physical		
Dimensions	Width: 8.3" (210 mm) Height: 5.1" (130 mm) Depth: 14.8" (375 mm)	
Weight	11 lb. ( 5kg )	
General		
Cooling	Convection (XPF 35-10), Fan (XPF 42-20)	
Power Consumption	600 VA max. (XPF 35-10), 1100 VA max. (XPF 60-20)	
Safety	Complies with EN61010-1	
EMC	Complies with EN61326	
Regulatory	CE-marked units meet: EN61010-1 and EN61326	
Protection Features		
Over voltage protection per output		
Switchable remote or local sense		

All specifications are subject to change

## Power Envelope (each output)

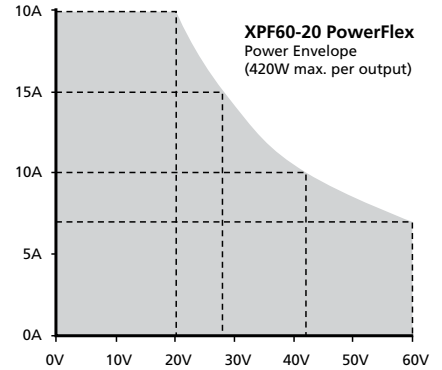
The maximum current at any voltage setting is limited by the power envelope which is set to give 5A at 35V rising to 10A at 12V and lower.

Double the current or double the voltage can be achieved by parallel or series connection of the two outputs.

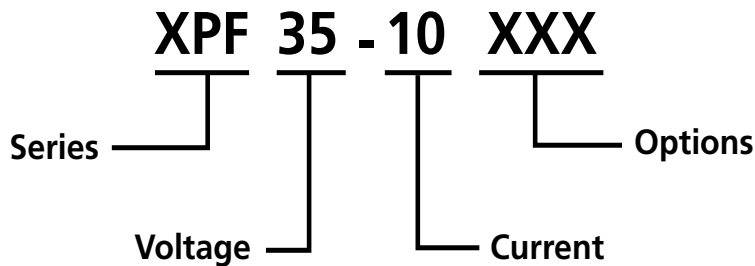


The maximum current at any voltage setting is limited by the power envelope which is set to give 7A at 60V rising to 20A at 20V and lower.

Double the current or double the voltage can be achieved by parallel or series connection of the two outputs.



## Model Number Description



## Options and Accessories

MHV (Input Voltage Option)	230 VAC input factory set (XPF 35-10)
MHVL European line cord	Shipped with European line cord (XPF60-20D)
P	Ethernet, GPIB, RS232/423 (XPF60-20D only)

# XPF60-20D & XPF60-20DP



## XPF60-20D Advanced Features

As technology has changed, many products have moved from analog controls to digital ones. Although digital controls suit many instruments, they do not necessarily suit a bench power supply.

Customer research shows that many users prefer the speed and simplicity of conventional analog controls for setting voltage and current. Digital controls may offer greater precision, but often at the expense of ease-of-use. With this in mind, the XPF60-20DP retains the true analog controls of its predecessor.

The main disadvantage of analog controls is stability and security. The settings of analog potentiometers can drift over time. More importantly, the settings can

### Lock your settings at the touch of a button!



be changed accidentally with potentially serious consequences. The XPF60-20DP incorporates S-Lock. One press of the Lock button transfers control of voltage and current from the analog controls to internal digital circuitry. This offers not just complete security, but exceptional stability as well with each setting controlled by an instrumentation quality DAC.

### Isolated voltage tracking for maximum flexibility

The two outputs of the XPF60-20DP are completely independent and electrically isolated from each other.

With V-Track selected, the two outputs remain electrically isolated, but the voltage control of the Master output sets an



- Dual output PowerFlex dc power supply - 840 watts total power
- High performance autoranging outputs, 60V and 20A maximum
- True analog controls with digital functionality including S-Lock
- isolated tracking for easy series/parallel use - up to 120V or 40A
- GPIB, RS-232, USB and LAN interfaces; LXI class C compliance

identical voltage on the Slave output. This enables the user to create two rails of either polarity and to reference them to different grounds if necessary (e.g. digital ground and analog ground). Alternatively the outputs can be wired in series or parallel to create a voltage capability up to 120V or a current capability up to 40A with the voltage set using a single control.

### Independent and simultaneous output control

The Both On/Both Off button is in addition to the individual switches for each output, and allow both outputs to be turned on or off synchronously by a single button press.

Synchronous switching of the outputs is of increasing importance for circuitry which can be damaged if one voltage rail is present without the other. Different grounds if necessary (e.g. digital ground and analog ground). Alternatively the outputs can be wired in series or parallel to create a voltage capability up to 120V or a current capability up to 40A with the voltage set using a single control.

### Range control offers even more flexibility

As an alternative to PowerFlex operation (60V/20A subject to a power limit), the XPF60-20DP can be used as a conventional fixed range power supply of either 60V/7A or 20V/20A at the press of a button.



Fixed range mode ensures that, whatever the load, the output can only be in constant voltage or constant current mode and never in power limit. Additionally finer resolution is provided on the current or voltage controls respectively.

A further button offers full customisation of voltage and current limits which can be set to suit the users application. This has the advantage that the controls cover the exact voltage and current range required, providing easier setting and reduced risk of error.

For example, the range could be set to 30V and 14A to create a 30 volt PSU of maximum current capability. Alternatively it could be set to 5V and 3A if this was all that was required for a particular application.

### Rear output terminals (with optional digital control)

Power and sense terminals are duplicated on the rear panel for rack mount applications or other situations where rear connection is more appropriate.

### Digital remote control (optional)

To meet the varying needs of today's engineers, a comprehensive array of interfaces is provided. RS-232, USB, GPIB and LAN (Ethernet) with LXI support are provided as standard. Each of the digital bus interfaces provides full control of voltage, current, and output on/off, plus read-back of voltage, current and status. The interfaces are at ground potential and are opto-isolated from the output terminals.

**GPIB** The GPIB interface is compliant with IEEE-488.1 and IEEE-488.2. Currently GPIB remains the most widely used interface for system applications.

**RS-232** An RS-232/RS-423 interface is provided for use with legacy systems. This type of serial interface remains in common useage and is perfectly satisfactory for the control of power supplies because data speed is not an issue.

**USB** USB provides a simple and convenient means of connection to a PC and is particularly appropriate for small system use. A USB driver is provided which supports Windows 2000, XP, Vista and Windows 7.

**LAN (Ethernet)** The LAN interface uses a standard 10/100 base-T Ethernet hardware connection with ICMP and TCP/IP Protocol for connection to a Local Area Network or direct connection to a single PC. This interface supports LXI and is highly appropriate for system use because of its scalable nature and low cost interconnection.