



Fig.1: DP-S Series Power Supply (DP120-30S)

1. Introduction

Laboratory Power Supplies of the DP-S series form the entry class of our high-performance power supplies and offer excellent performance and reliability in a small cabinet, manufactured as a desktop device with transport handle. Ideal for high performance applications such as load testing of inverters, charging accumulators and capacitor banks or load testing of heating elements. Laboratory power supplies of the DP-S series can also be used in industrial processes completely maintenance-free under up to 80% load.

2. Features of the DP-S series

- **Maximum output Voltage 600V**
- **Maximum output Current 250A**
- **Maximum output Power 6kW**
- **4 Digit LED Display for Voltage, Current**
- **Constant Voltage (CV) and Constant Current (CC) operation**
- **Analog connection possibilities available: Voltage & Current control (0-10V, 0-5V, 4-20mA)**
- **Constant operation 24/7 at up to 80% load possible**
- **Fine and coarse adjustment**
- **Variable over voltage protection**
- **Digital connection over RS232 with Modbus-RTU support**

3. Dimensioning Guidelines

All of our laboratory power supplies and industrial power sources are designed and tested to supply the maximum rated power continuously, but the recommended power range for continuous use is 0 ... 80% of the rated power to ensure best possible performance and longevity. Following you will find guidelines which we strictly recommend to follow while picking the correct power supply model.

3.1 Definition of „continuous operation“

The power supply is under continuous operation if operated longer than 12 hours a day, or 8 hours a day for at least 5 following days.

3.2 Continuous operation guidelines

If the power supply is intended to be used in a industrial process (automated or not) which requires continuous (See point 3.1) power supply at a given capacity x it is strictly recommended to use a power supply with a maximum power of 120% of x. This will ensure that the power supply does not operate near its limits and thus keep the components cool what ensures a significantly longer life time of the equipment and better performance.

4. DSC-Electronics DC Laboratory Power Supply series comparison

	DP-D SERIES	DP-S SERIES	DP-P SERIES	DP-PH SERIES	DP-H SERIES
Voltage:	0 ... 2kV	0 ... 1000V	0 ... 600V	0 ... 12kV	0 ... 150V
Current:	0 ... 5kA	0 ... 250A	0 ... 300A	0 ... 1.2A	0 ... 60A
Power:	0 ... 1MW	0 ... 6kW	0 ... 6kW	0 ... 1200W	0 ... 900W
Cabinet:	19"	Non-Standard	19"	19"	Non-Standard
Regulation:	U / I / P*	U / I	U / I	U / I	U / I
Load Regulation U:	≤0.3% + 2 dig	≤0.5% + 2 dig	≤0.1% + 2 LSB	≤0.5% + 2 LSB	≤0.1% + 5mV
Load Regulation I:	≤0.3% + 2 dig	≤0.5% + 2 dig	≤0.2% + 2 LSB	≤0.5% + 2 LSB	≤0.2% + 5mV
Line Regulation U:	≤0.2% + 2 dig	≤0.2% + 2 dig	≤0.1% + 2 LSB	≤0.1% + 2 LSB	≤0.01% + 4mV
Line Regulation I:	≤0.3% + 2 dig	≤0.5% + 2 dig	≤0.1% + 2 LSB	≤0.1% + 2 LSB	≤0.2% + 3mV
Noise U:	≤0.3%FS + 10mVrms	≤1%FS (rms)	Depending o. Model ≤50mV to ≤200mV	≤0.05%FS	≤2mVrms / ≤30mVpp
Noise I:	≤0.5%FS + 10mArms	≤1%FS (rms)	Depending o. Model ≤50mA to ≤200mA	≤0.05%FS	≤10mArms
Recovery Time (50% Chg.):					≤1.5ms
Display Accuracy U:	±1% reading ± 5 dig	±1%FS ± 1 dig	≤0.2% + 2 LSB	≤0.2% + 2 LSB	±0.02% reading + 5mV
Display Accuracy I:	±1% reading ± 10 dig	±1%FS ± 1 dig	≤0.5% + 2 LSB	≤0.5% + 2 LSB	±0.1% reading + 0.1%FS
Setting Accuracy U:	±0.5% reading ± 5 dig	±0.5% reading ± 2 dig	≤0.2% + 2 LSB	≤0.2% + 2 LSB	±0.03% reading + 10mV
Setting Accuracy I:	±1% reading ± 20 dig	±1% reading ± 2 dig	≤0.5% + 2 LSB	≤0.5% + 2 LSB	±0.1% reading + 0.1%FS
Ext. Control Analogue:	Yes*	Yes*	No	No	Yes
Ext. Feedback Analogue:	Yes*	No	No	No	Yes
RS232:	Yes*	Yes	Yes	Yes	Yes
RS485:	Yes*	No	Yes	Yes	Yes*
RS422:	No	No	Yes	Yes	No
Open Protocol:	Yes	No	Yes	Yes	Yes
Modbus-RTU:	No	Yes	Yes	Yes	Yes*
SCPI:	No	No	No	No	Yes
Reverse Current Protection:	Yes*	Yes*	No	No	Yes
Polarity Switch:	Yes*	No	No	No	No
Interlock:	Yes*	Yes*	No	No	No
Ext. Outp. On/Off Contr.:	Yes*	Yes*	No	No	Yes

* Optional

5. Typical Electrical Characteristics Of The DF-S Series

Voltage:	0 ... 1000V
Current:	0 ... 200A
Power:	0 ... 6kW
Cabinet:	Non-Standard
Regulation:	U / I
Load Regulation U:	≤0.5% + 2 dig
Load Regulation I:	≤0.5% + 2 dig
Line Regulation U:	≤0.2% + 2 dig
Line Regulation I:	≤0.5% + 2 dig
Noise U:	≤1%FS (rms)
Noise I:	≤1%FS (rms)
Recovery Time (50% Chg.):	
Display Accuracy U:	±1%FS ± 1 dig
Display Accuracy I:	±1%FS ± 1 dig
Setting Accuracy U:	±0.5% reading ± 2 dig
Setting Accuracy I:	±1% reading ± 2 dig
Ext. Control Analog:	Yes*
Ext. Feedback Analog:	No
RS232:	Yes
RS485:	No
RS422:	No
Open Protocol:	No
Modbus-RTU:	Yes
SCPI:	No
Reverse Current Protection:	Yes*
Polarity Switch:	No
Interlock	Yes*
Ext. Output On/Off Ctrl.	Yes*

* Optional

4.1 Power Grid Requirements

4.1.1 EU Version

All Configurations

Power grid: 1 Ph. (PE, L1, N) 230V AC 50/60Hz ±10%
 Nominal operation Current (A): $I = (\text{Output P} / 230) + 2$
 Slow start circuit type: Active
 Maximal inrush Current (A): $I = \leq(\text{Max. device P} / 230) + 10$
 Suggested circuit breaker type: C, D, K

4.1.2 US Version

All Configurations

Power grid: 1 Ph. (PE, L1, N) 120V AC 50/60Hz ±10%
 Nominal operation Current (A): $I = (\text{Output P} / 120) + 2$
 Slow start circuit type: Active
 Maximal inrush Current (A): $I = \leq(\text{Max. device P} / 120) + 10$
 Suggested circuit breaker type: C, D, K

6. Mechanical Characteristics

5.1 Cabinet Types

Cabinet Size	Dimensions	DIN 41494 SC48D	Used With
1	200W x 150H x 285D mm	Stand-Alone	P ≤ 1kW
2	260W x 160H x 380D mm	Stand-Alone	1kW < P ≤ 3kW
3	260W x 160H x 440D mm	Stand-Alone	3kW < P ≤ 6kW

Note: The above frame dimension dose not include knobs, terminals or standing feet/wheels.

Stand-Alone Rack Characteristics

Description: Stand alone (table top).

Material: 1mm steel plates.

Bottom: Rubber feet.

Front: Display and control elements, external control connection on the front.

Rear: Input & Output connections, fuse.

5.2 Size table

Model	Basic Version	
	Cabinet Size	Weight (kg)
DP15-10S	1	3.0
DP15-10S	1	3.0
DP15-20S	1	3.0
DP15-30S	1	3.0
DP15-50S	1	3.3
DP15-60S	1	3.3
DP30-10S	1	3.0
DP30-20S	1	3.3
DP30-30S	1	3.3
DP60-10S	1	3.3
DP1H-3S	1	3.0
DP1H-5S	1	3.3
DP120-3S	1	3.0
DP120-5S	1	3.3
DP150-1S	1	3.0
DP150-2S	1	3.0
DP150-3S	1	3.0
DP150-5S	1	3.3
DP2H-1S	1	3.0
DP2H-2S	1	3.0
DP2H-3S	1	3.3
DP220-1S	1	3.0
DP220-2S	1	3.0
DP220-3S	1	3.3
DP250-1S	1	3.0
DP250-3S	1	3.3
DP3H-1S	1	3.0
DP3H-2S	1	3.3
DP3H-3S	1	3.3
DP15-80S	2	5.5
DP15-1HS	2	5.5
DP15-120S	2	5.7
DP15-150S	2	6.3
DP30-40S	2	5.5
DP30-50S	2	5.5
DP30-60S	2	5.7
DP30-80S	2	6.3
DP50-30S	2	5.5

DP50-50S	2	6.3
DP60-20S	2	5.5
DP60-30S	2	5.7
DP1H-10S	2	5.0
DP1H-20S	2	6.1
DP120-10S	2	5.5
DP120-20S	2	6.3
DP150-10S	2	5.5
DP2H-5S	2	5.0
DP2H-10S	2	6.1
DP250-5S	2	5.5
DP250-10S	2	6.3
DP3H-5S	2	5.5
DP4H-1S	2	5.5
DP4H-2S	2	5.5
DP4H-3S	2	5.5
DP4H-5S	2	6.1
DP5H-1S	2	5.5
DP5H-2S	2	5.5
DP5H-3S	2	5.5
DP5H-5S	2	6.1
DP6H-1S	2	5.5
DP6H-2S	2	5.5
DP6H-3S	2	5.5
DP30-1HS	3	8.0
DP30-150S	3	9.3
DP50-60S	3	8.0
DP50-80S	3	9.0
DP50-1HS	3	9.3
DP60-50S	3	8.0
DP60-60S	3	8.0
DP60-80S	3	9.0
DP1H-30S	3	8.0
DP1H-50S	3	9.0
DP120-30S	3	8.0
DP120-40S	3	9.0
DP150-20S	3	8.0
DP150-30S	3	9.0
DP2H-20S	3	9.0
DP250-20S	3	9.0
DP3H-10S	3	8.0
DP4H-10S	3	9.0
DP5H-10S	3	9.0
DP6H-5S	3	6.5

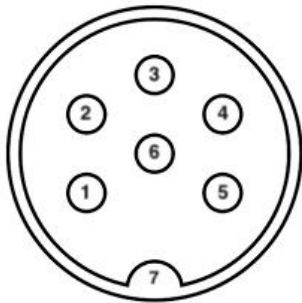
5.3 Connection Plugs & Terminals

5.3.1 Power Grid Connection

DP-S Series power supplies are equipped with a C19 socket on the rear side for connection of the input power. The input connection has 3 (N, L1, PE) terminals.

5.3.2 Analog Connections

The DP-S series devices can be equipped with optional functions. If these optional functions require any signal In- / Output connections, these are located on the front side of the device accessible through a DIN-6.



Pin 1: External U control (5V, 10V, 4-20mA)

Pin 2: External I control (5V, 10V, 4-20mA)

Pin 3: -

Pin 4: -

Pin 5: -

Pin 6: External output On/Off control & Interlock

Pin 7: GND

6. Options & Model Number

The DP-S Series can be configured with options, which are described below.

[U] Ext. analog control U

Input for external control of the output voltage via an analog control signal.

Possible configurations:

[1] 0 - 10V Signal

[2] 0 - 5V Signal

[3] 4 - 20mA Signal

The Voltage of the power supply can either be controlled internally, or externally which is selected by a switch on the front side of the device.

[L] Ext. analog control I

Input for external control of the output current via an analog control signal.

Possible configurations:

[1] 0 - 10V Signal

[2] 0 - 5V Signal

[3] 4 - 20mA Signal

The Current of the power supply can either be controlled internally, or externally which is selected by a switch on the rear side of the device.

[A] Ext. Output On/Off Ctrl. & Interlock

Input for controlling the status of the output of the laboratory power supply (on / off), switchable as "Interlock" or external control. This input is configured as a two pin connection, a „true" state is triggered by shorting the two pins and a „false" state is triggered by removing any connection between the two pins of the input.

This option can be configured as either an interlock input, which disables the output of the power supply if the state is false, or as an external output status control which enables or disables the output of the power supply depending on the control signal state (true = on/false = off) if the „Output On/Off" switch of the power supply is always in the ON position.

[R] Reverse current protection

Reverse current protection when operating with large inductive or capacitive loads.

Possible configurations:

[1] Passive (Diode Circuit)

[2] Active (Braking Chopper)

Passive

Diode based protection circuit consisting of two diodes (parallel fly-back and in series).

Active (Braking Chopper)

The output of the power supply becomes low resistive as soon as triggered (<20 Ohm), and is capable of absorbing excess power of:

10% of max. P -> Continuous

100% of max. P -> 1.5 second shots, every 2 seconds

6.1 Model Number

The model number is encrypted as follows:

Model Number [Accessory, Accessory, ...] [Option (Suboption), Option (Suboption), ...]

Example: DP5H-10S U1L3A

Example Model: DP5H-10S

Example Accessories: -

Example Options: U1, L3, A