



Fig.1: DF-S Series Power Supply (DF-S5105)

1. Introduction

True-Sine AC Laboratory Power Supplies of the DF-S series provide excellent stability, precision, performance and functionality in a compact laboratory power supply. The ARM microprocessor-based advanced digital controller provides fast response times and constant output monitoring, resulting in high stability and accuracy. Partly equipped with RS232 connection (51XXX models), the power supply can be controlled via an open protocol, the front panel also allows easy setting and monitoring of the output values even in autonomous operation. Designed for laboratory and industrial use, AC power supplies of the DF-S series can also be operated 24/7 at full load and feature a strong overpower capacity of 300% for 2s plus 1.5x the maximum rated current for 100ms. .

2. Features of the DF-S series

- **Maximum output Voltage 300Vrms L-N**
- **Maximum output Current 42A L-N**
- **Maximum output Power 3KVA**
- **Over-Power Capacity of 300% for 2s**
- **Transient Currents up to 1.5x the rated current for 100ms**
- **True-Sine Waveform**
- **Adjustable Frequency 45Hz ... 250Hz in 0.1Hz steps**
- **4 Digit LED Display for Voltage, Current, Frequency, Power and Power Factor(Preset and actual values)**
- **Constant Voltage (CV) operation**
- **Digital connection possibilities available on DF-S51XXX models: RS232**
- **Constant operation 24/7 at full load possible**
- **Capable of complete remote operation through RS232 (only DF-S51XXX models)**
- **Memory for Voltage, Frequency presets**

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 AC Laboratory Power Supply series comparison

	DF-C63XXX SERIES	DF-C61XXX SERIES	DF-S51XXX SERIES	DF-S50XXX SERIES
Output Phase:	3	1	1	1
Voltage:	0 ... 2kVrms L-N	0 ... 2kVrms L-N	0 ... 300Vrms L-N	0 ... 300Vrms L-N
Current:	0 ... 3kA L-N	0 ... 3kA L-N	0 ... 42A L-N	0 ... 42A L-N
Frequency:	47Hz ... 63Hz / 100Hz* / 200Hz* / 400Hz*	47Hz ... 63Hz / 100Hz / 200Hz / 400Hz*	45Hz ... 250Hz	45Hz ... 250Hz
Power:	0 ... 1MVA	0 ... 1MVA	0 ... 5KVA	0 ... 1200VA
Cabinet:	Stand-Alone Rack	Stand-Alone Rack	Non-Standard	Non-Standard
Regulation:	U	U	U	U
Load Regulation U:	≤1%	≤1%	≤1%	≤1%
Line Regulation U:	≤1%	≤1%	≤1%	≤1%
Frequency Stability:	≤0.01%	≤0.01%	≤0.01%	≤0.01%
Voltage Stability:	±1%	±1%	±1%	±1%
Harmonic Distortion:	≤2%	≤2%	≤2%	≤2%
Crest Factor:	≤2%	≤2%	≤2%	≤2%
Recovery Time (50% Chg.):	≤15ms	≤15ms	≤15ms	≤15ms
Display Accuracy U:	±0.5% FS + 5 dig	±0.5% FS + 5 dig	±0.5% FS + 5 dig	±0.5% FS + 5 dig
Display Accuracy I:	±0.5% FS + 5 dig	±0.5% FS + 5 dig	±0.5% FS + 5 dig	±0.5% FS + 5 dig
Display Accuracy P:	±0.5% FS + 5 dig	±0.5% FS + 5 dig	±0.5% FS + 5 dig	±0.5% FS + 5 dig
Display Accuracy F:	±0.01% FS + 5 dig	±0.01% FS + 5 dig	±0.01% FS + 5 dig	±0.01% FS + 5 dig
Setting Accuracy U:	±1% FS	±1% FS	±1% FS	±1% FS
Setting Accuracy F:	±0.1% FS	±0.1% FS	±0.1% FS	±0.1% FS
Ext. Control Analogue:	Yes*	Yes*	No	No
Ext. Feedback Analogue:	Yes*	Yes*	No	No
RS232:	Yes*	Yes*	Yes	No
RS485:	Yes*	Yes*	No	No
RS422:	Yes*	Yes*	No	No
Open Protocol:	Yes	Yes	Yes	-
Modbus-RTU:	No	No	No	-
SCPI:	No	No	No	-
Interlock:	Yes*	Yes*	Yes*	Yes*
Ext. Outp. On/Off Contr.:	Yes*	Yes*	Yes*	Yes*

* Optional

5. Typical Electrical Characteristics Of The DF-S Series

Phase:	1
Voltage:	0 ... 300Vrms L-N
Current:	0 ... 42A L-N
Frequency:	45Hz ... 250Hz
Power:	0 ... 3KVA
Cabinet:	Non-Standard
Regulation:	U
Load Regulation U:	≤1%
Line Regulation U:	≤1%
Frequency Stability:	≤0.01%
Voltage Stability:	±1%
Harmonic Distortion:	≤2%
Crest Factor:	≤2%
Recovery Time (50% Chg.):	≤15ms
Display Accuracy U:	±0.5% FS + 5 dig
Display Accuracy I:	±0.5% FS + 5 dig
Display Accuracy P:	±0.5% FS + 5 dig
Display Accuracy F:	±0.01% FS + 5 dig
Setting Accuracy U	±1% FS
Setting Accuracy F:	±0.1% FS
Ext. Control Analogue:	No
Ext. Feedback Analogue:	No
RS232:	Yes (only 51XXX Models)
RS485:	No
RS422:	No
Open Protocol:	Yes
Modbus-RTU:	No
SCPI:	No
Interlock:	Yes*
Ext. Outp. On/Off Contrl.:	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	365W x 145H x 450D mm	Stand-Alone	DF-S50XXX
2	430W x 133H x 480D mm	Stand-Alone	DF-S510/05/1
3	430W x 222H x 480D mm	Stand-Alone	DF-S510/2/3

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

Stand-Alone Rack Characteristics

Description: Stand alone (table top) rack.

Material: 1.5mm steel plates.

Bottom: Rubber feet.

Front: Display and control elements on the front.

Rear: Input & Output connections, fuse.

5.2 Size table

Basic Version		
Model	Cabinet Size	Weight
DF-S500035	1	13.5kG
DF-S50007	1	16kG
DF-S50012	1	20kG
DF-S51005	2	20kG
DF-S5101	2	25kG
DF-S5102	3	30kG
DF-S5103	3	50kG

5.3 Connection Plugs & Terminals

5.3.1 Power Grid Connection

DF-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 RS232

DF-C series DF-S51XXX models are equipped with an RS232 connection to read/write output values in real time.

(Please see communication protocol at the end of the manual)

5.3.3 Analog Connections

The DF-S series devices can be equipped with optional functions. If these optional functions require any signal In- / Output connections, these are located on the rear side of the device accessible through a terminal block. The pin-out is described below the terminal block.

7. Options & Model Number

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

[A] Interlock

A security loop shutting down the output of the power supply immediately if open and triggering an internal alarm.

6.1 Model Number

The model number is encrypted as follows:

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

Example: DF-S5101 A

Example Model: DF-S5101

Example Accessories: -

Example Options: A