

SWITCHING POWER SUPPLIES FOR GALVANOTECHNOLOGY AND ELECTROCHEMISTRY

Characteristics

Power supplies are designed on the basis of the most modern production technologies of switching power supplies with IGBT elements. Efficiency course depending on power supply load is in wide range almost constant. They are characterized also by very good dynamic properties, very low output voltage ripple, high efficiency to 92% and low interference intensity thanks to perfect filters. Power supply output is short circuit proof and galvanically separated from the input.

Application

In different industry areas, where are technological equipments needed – switching power supplies. Examples of application: devices for galvanotechnology, water neutralization, eloxal coating, electrophoresis surface treatment, electrochemical varnishing – “clean”, degreasing and any effective load.

to 40A

TYPE

Input voltage	1NPE 230 V $\pm 10\%$, TN – C
Input frequency	47 to 63 Hz
Nominal output current	20 A
Nominal output voltage	24 V DC
Output current on demand	10 ... 40 A
Output voltage on demand	5 ... 32 V DC
Max. output power	480 W
Ripple	$\leq 1\%$ of output voltage
Adjustment range of output current and voltage	1 to 100% of nominal value
Efficiency / power factor	0,96 / 92%
Insulation strength	2 kV AC input, output against frame 4 kV AC transformer primary winding – secondary winding
Weight approx.	7 kg
Ingress protection	IP 44
Dimensions /W x H x D/ / box type	300 x 300 x 230 mm / plastic



to 100A

TYPE

Input voltage	3NPE 400 V $\pm 10\%$, TN–S
or	1NPE 230 V $\pm 10\%$, TN–C
Input frequency	47 to 63 Hz
Nominal output current	100 A
Nominal output voltage	24 V DC
Output current on demand	20 ... 100 A
Output voltage on demand	5 ... 32 V DC
Max. output power	2,4 kW
Ripple	$\leq 1\%$ of output voltage
Adjustment range of output current and voltage	1 to 100% of nominal value
Efficiency / power factor	0,96 / 92%
Insulation strength	2 kV AC input, output against frame 4 kV AC transformer primary winding – secondary winding
Weight approx.	35 – 40 kg
Ingress protection	IP 20, IP 44
Dimensions / box type	260 x 490 x 480 / N3
/W x H x D/ mm	255 x 620 x 500 / N4 166 x 1040 x 365 / B3.1 500 x 500 x 210 / Rittal 400 x 500 x 230 / plastic



Rittal



N3



B3.1



plastic



N4

to 200A

TYPE

Input voltage	3NPE 400 V $\pm 10\%$, TN – S
Input frequency	47 to 63 Hz
Nominal output current	200 A
Nominal output voltage	8 V DC
Output current on demand	50 ... 200 A
Output voltage on demand	5 ... 30 V DC
Max. output power	1,6 kW
Ripple	$\leq 1\%$ of output voltage
Adjustment range of output current and voltage	1 to 100% of nominal value
Efficiency / power factor	0,96 / 92%
Insulation strength	2 kV AC input, output against frame 4 kV AC transformer primary winding – secondary winding
Weight approx.	38 – 45 kg
Ingress protection	IP 20
Dimensions / box type	255 x 620 x 500 / N4
W x H x D / mm	166 x 1040 x 365 / B3.1



B3.1



N4

to 300A

TYPE

Input voltage	3NPE 400 V $\pm 10\%$, TN – S
Input frequency	47 až 63 Hz
Nominal output current	250 A
Nominal output voltage	15 V DC
Output current on demand	100 ... 300 A
Output voltage on demand	5 ... 30 V DC
Max. output power	3,75 kW
Ripple	$\leq 1\%$ of output voltage
Adjustment range of output current and voltage	1 to 100% of nominal value
Efficiency / power factor	0,96 / 92%
Insulation strength	2 kV AC input, output against frame 4 kV AC transformer primary winding – secondary winding
Weight approx.	38 – 45 kg
Ingress protection	IP 20, IP 43
Dimensions / box type	255 x 620 x 500 / N4
W x H x D / mm	166 x 1040 x 365 / B3.1 600 x 800 x 300 / Rittal plastic 500 x 700 x 270 / plastic



B3.1



Rittal plastic



plastic



N4

to 600A

TYPE

Input voltage
Input frequency
Nominal output current
Nominal output voltage
Output current on demand
Output voltage on demand
Max. output power
Ripple
Adjustment range of
output current and voltage
Efficiency / power factor
Insulation strength

Weight approx.
Ingress protection
Dimensions / box type
/W x H x D/ mm

SZ 500 15/400

3NPE 400 V $\pm 10\%$, TN – S
47 to 63 Hz
500 A
15 V DC
250 ... 600 A
5 ... 30 V DC
7,5 kW
 $\leq 1\%$ of output voltage
1 to 100% of nominal value
0,96 / 92%
2 kV AC input, output against frame
4 kV AC transformer primary winding
– secondary winding
50 kg
IP 20, IP 43, IP 54
250 x 1040 x 365 / B2.1
800 x 600 x 300 / plastic I
750 x 1065 x 400 / plastic II
600 x 1200 x 400 / Rittal
600 x 800 x 350 / N5.1



B2.1



N5.1



plastic I



plastic II



Rittal

to 1250A

TYPE

Input voltage
Input frequency
Nominal output current
Nominal output voltage
Output current on demand
Output voltage on demand
Max. output power
Ripple
Adjustment range of
output current and voltage
Efficiency / power factor
Insulation strength

Weight approx.
Ingress protection
Dimensions / box type
/W x H x D/ mm

SZ 1000 15/400

3NPE 400 V $\pm 10\%$, TN – S
47 to 63 Hz
1000 A – B1, 1250 A – B1.1
15 V DC – B1, 12 V DC – B1.1
500 ... 1250 A
5 ... 30 V DC
15 kW
 $\leq 1\%$ of output voltage
1 to 100% of nominal value
0,96 / 92%
2 kV AC input, output against frame
4 kV AC transformer primary winding
– secondary winding
80 – 90 kg
IP 20, IP 54
332 x 1060 x 365 / B1
332 x 1060 x 410 / B1.1
750 x 1315 x 400 / plastic



B1, B1.1



plastic

to 2000A

TYPE

Input voltage	3NPE 400 V $\pm 10\%$, TN – S
Input frequency	47 až 63 Hz
Nominal output current	1500 A
Nominal output voltage	15 V DC
Output current on demand	750 ... 2000 A
Output voltage on demand	5 ... 30 V DC
Max. output power	22,5 kW
Ripple	$\leq 1\%$ of output voltage
Adjustment range of output current and voltage	1 to 100% of nominal value
Efficiency / power factor	0,96 / 92%
Insulation strength	2 kV AC input, output against frame 4 kV AC transformer primary winding – secondary winding
Weight approx.	115 kg
Ingress protection	IP 20
Dimensions / box type	490 x 1060 x 410 / B1.2
/W x H x D/ mm	



B1.2

Equipment and options

Parallel connection of power supply modules B1 ... B3.1:

Output voltage / current (DC)	6V	10V	15V	18V	20V	30V
100A	B3.1	B3.1	B3.1	B3.1	B3.1	B3.1
200A	B3.1	B3.1	B3.1	B3.1	B2.1	B2.1
250A	B3.1	B3.1	B3.1	B2.1	B2.1	B2.1
300A	B3.1	B3.1	B2.1	B2.1	B2.1	B1
500A	B2.1	B2.1	B2.1	B1	B1	B1
600A	B2.1	B2.1	B1	B1	B1	B1.1
1000A	B1	B1	B1	B1.2	B1.2	2x B1
1250A	B1.1	B1.1	B1.2	B1.2	2x B1	2x B1.2
1500A	B1.2	B1.2	B1.2	2x B1	2x B1	2x B1.2
2000A	B1.2	B1.2	2x B1	B1.1+B1.2	2x B1.2	3x B1.2
2500A	2x B1.1	2x B1.1	2x B1.2	2x B1.2	3x B1.2	4x B1.2
3000A	2x B1.2	2x B1.2	2x B1.2	3x B1.2	3x B1.2	4x B1.2
3600A	2x B1.2	2x B1.2	3x B1.2	3x B1.2	4x B1.2	5x B1.2
4000A	2x B1.2	2x B1.2	3x B1.2	4x B1.2	4x B1.2	6x B1.2
5000A	3x B1.2	3x B1.2	4x B1.2	4x B1.2	5x B1.2	7x B1.2
6000A	3x B1.2	3x B1.2	4x B1.2	5x B1.2	6x B1.2	8x B1.2
7000A	4x B1.2	4x B1.2	5x B1.2	6x B1.2	7x B1.2	-
8000A	4x B1.2	4x B1.2	6x B1.2	7x B1.2	-	-

- **parallel – redundant connection of modules:** by module or several modules failure is possible the power supply operation without interruption, but with lower output power (total output power reduced by output power of fault modules)

Standard accessory of power supply with analog control:

- analog inputs (current loop 0-20mA or voltage signal 0-10V) for parameter adjusting (I, U) from the master control system
- analog outputs (current loop 0-20mA or voltage signal 0-10V) for parameter monitoring (I, U) from the master control system

Standard accessory of power supply with analog control – M.8:

- on the terminal board of the power supply are terminals for RS 485 line connection
- Modbus communication protocol

Optional accessory:

(note: SDO = remote control box)

- Analog control of power supply by SDO 22 (SDO 26):
 - start and stop of the power supply – output blocking, switch + LED
 - adjusting of required current and voltage values by potentiometers
 - displaying of measured values (I, U) by pointer (digital – SDO 26) measuring instruments
 - maximum distance (cable length) of SDO box from the power supply is 100 m
- Analog control of power supply by SDO 42:
 - control panel with keyboard and LCD display and LED indicators
 - start and stop of the power supply – output blocking, buttons
 - digital measuring instruments of output current and voltage
 - lighthouse signalling – red – stop or failure, green – operation, blue – additive dosing
- Software for SDO xx with microprocessor control:
 - eloxal coating, voltage and current pulsing, continuous rise of voltage and current by the ramp, ampere-hour meter, stop-watch etc.
- Power supplies with output voltage:
 - to 100 V DC – eloxal coating etc.
 - to 400 V DC – electrophoresis surface treatment etc.
- Equipment of power supply with control and monitoring module – „mNES“, which includes ampere-hour meter, stop-watch and dosing device:
 - located on the front panel of the power supply
 - or located on SDO xx box.



SDO 22



SDO 42



DD 04-M.8



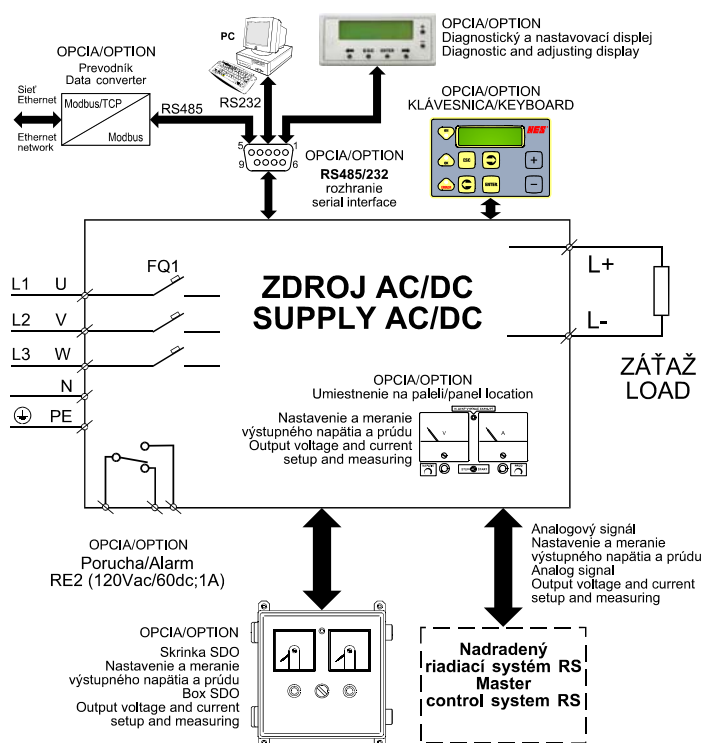
mNES

- Diagnostic and adjusting display DD 04-M.8 for power supplies with M.8 control only, for total control of power supplies and also RS 485 communication setting
- Semiconductor reverse devices to 2500A for often switching, approx. 1x per 1 second, by shorter times as 1s on demand
- Contactor reverse devices to 10000A for occasional switching approx. 10 x per day
- Communication, monitoring and remote control of power supplies through connection of power supply control input to communication bus, their integration into the net, with utilization all of the available technologies used in automation technology.

Customized power supplies:

The company NES Nová Dubnica s.r.o. also produces the power supplies according to customer requirements with other parameters – output voltage, output current, equipment of SDO (remote control box), special design version etc.

Block diagram – external connection and options:



Engineering and other services

- projecting activities (hardware and software) – solutions of electric devices for galvanizing plants
- delivery of control systems including delivery of drives
- delivery of electric devices (distributors etc.)
- mounting and installation at the customer