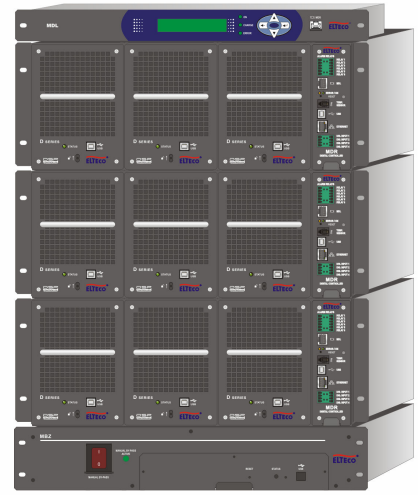
ISO 9001

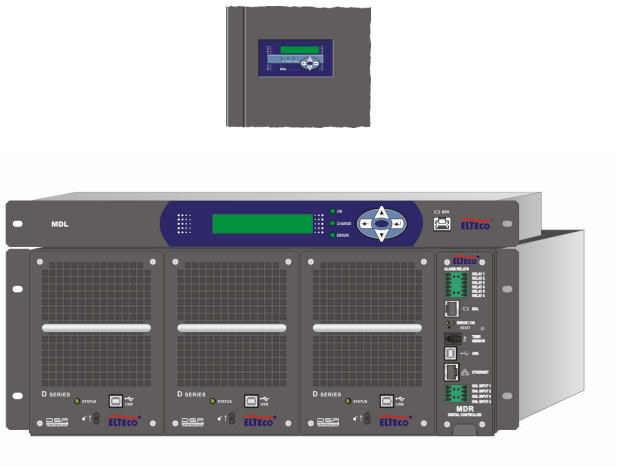
DC POWER SUPPLIES
DNX 110/220 V

Power supply systems DNX are dedicated to supply the equipment which needs for its operation direct voltage 110 / 220, with emphasis on maximum reliability and monitoring. Modular design of parallel modules of power up to 32,4kW – 9 pcs. these power DC modules, enables also additional extension of the power with redundancy. The unit with cabling is always ready for insertion of all modules max. into 3 racks.

Field of application: - power industry (distribution points, self-consumption, switching elements of distribution point)

- railways (converter stations and supplying stations)
- industry (technologies using the supply 110 and 220 V)





Main characteristics

POWER MODULE:

- processor control on DSP basis
- modular design
- digital communication interface – CAN
- possibility of parallel shifting
- PFC – Power Factor Corrector
- adjustable output voltage and current in wide range
- operating in various modes according to configuration of whole system
- visual indication of operating status
- possibility to upgrade firmware via USB
- plug & play – possibility to remove or add module without turning the module off, or without system turn off
- no need for additional configuration or adjustment of the module before or after connection into the system
- auto detection of voltage version of system , where the module is inserted.

SYSTEM:

- processor control on DSP basis
- advanced monitoring and functions
- high reliability
- modular design N + 1
- redundant control – possibility to add up to 3 control modules into one system
- digital CAN bus for the control of parallel cooperating power modules
- high maintenance comfort
- control panel with LCD display
- sound and visual indication
- 6 signalling relays – optional configuration of statuses
- possibility of monitoring via USB
- possibility of monitoring via Ethernet
- max 9 pcs. of power modules
- max. system power 32,4 kW
- max. output current 234 A (power supply mode, charger)
- max. output current 200 A (mode of battery supply)
- possible to connect 2 independent battery strings
- installation in 19“ cubicles

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Control and monitoring

Whole system is supervised by microprocessor control unit MDR001 with LCD module MDL001 (on door) or MDL002 (19“ / 1U).

The unit is dedicated to control and monitor the direct back-up power supplies with digital control of power modules with output voltage 110 / 220V. The control system and used circuits ensure not only basic, but also detailed control and monitor actions. It ensures whole system monitoring, battery care, watching of adjusted values of currents and voltages, control and monitoring of power modules, saving history of events, and much more.

In cooperation with module MBZ, the control unit optimises battery charging, gives the command for switch off when deep discharge appears. Batteries are external or internal and the power supply facilitates the connection of 2 independent strings. Charging characteristics can be U, IU, IUoU, USER. USER is user defined characteristic in 10 points. All charging characteristics are with temperature compensation of maintenance voltage.

Communication with user via dry contacts relay, serial interface USB, is enabled by SNMP adapter, LAN adapter or connection of GSM modem.

DC power modules

Modules are AC/DC rectifiers with mains input and direct output voltage 110 / 220 V. In cooperation with processor control module MDR001, after connection to mains and supplied equipment, these ensure supplying of connected units and optimal battery charging – if batteries are included. Power modules can also work independently, after fail of control module. Power modules are designed for 19" racks. Cooling is forced; front – rear side air flow. At parallel shifting of power modules, the sharing of current is not master/slave, but redundancy is absolute. When failure of any power module occurs, the remaining power modules take over the load and the system is able to cover fully the demand of connected equipment. Modules are managed fully digitally on the basis of DSP processors.

D 026110

D 014220

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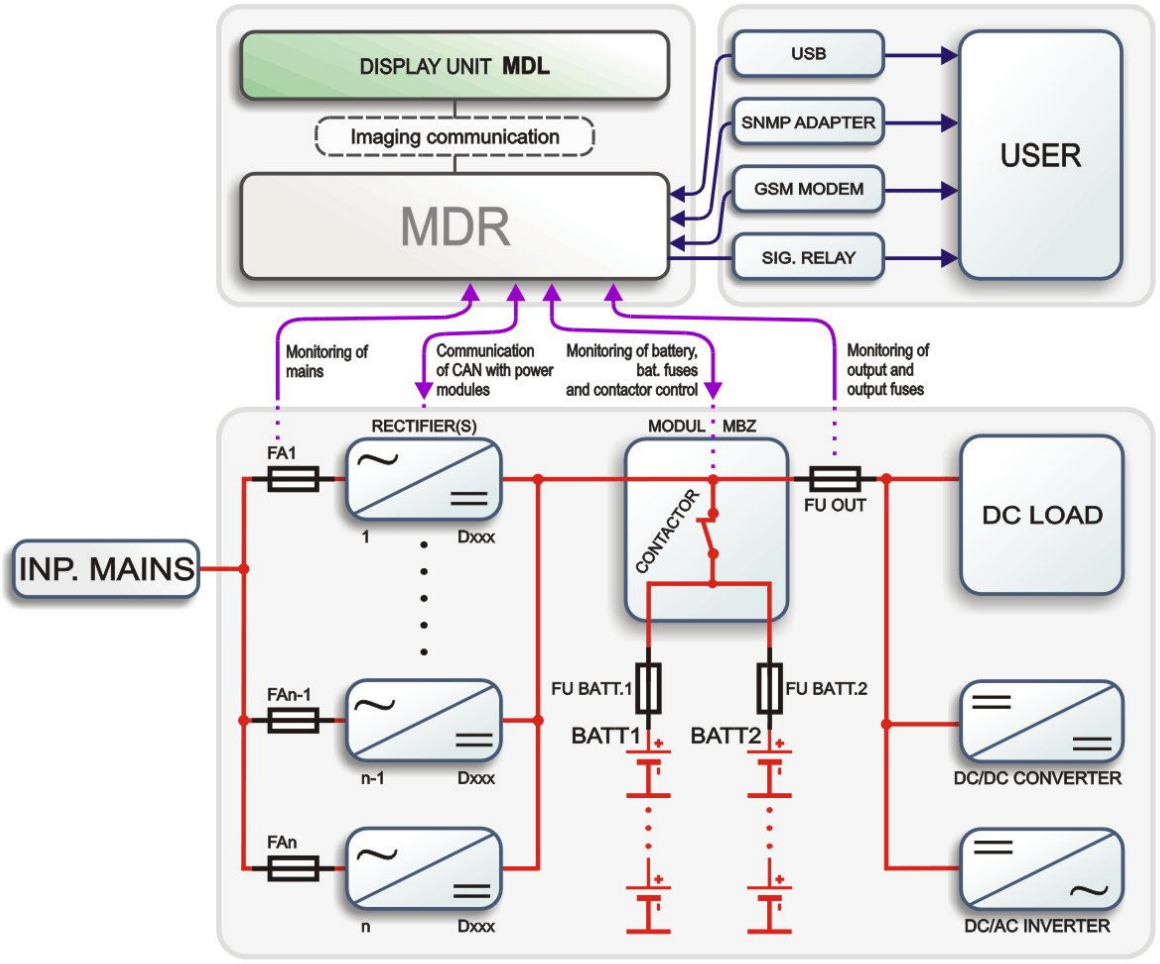
Principle block diagram



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Power modules

Type	Output			Input			Efficiency (%)	Max. number of parallel.units.	Number of modules in 19" rack	Dimensions (š x v x h) (mm)	Weight (kg)
	U_{output} (V)	$I_{output\ max}$ (A)	$P_{output\ max}$ (kW)	U_{input} (V)	$U_{input\ range}$ (V)	PFC					
D 014220	220	14	3,6	230	170-275 (275-300)*	> 0,98	> 85	9	3	127 x 4U x 460	8,5
D 026110	110	26	3,6	230	170-275 (275-300)*	> 0,98	> 85	9	3	127 x 4U x 460	8,5
MBZ 200220	220	200	52	-	-	-	-	1	1	438 x 2U x 430	
MBZ 200110	110	200	28	-	-	-	-	1	1	438 x 2U x 430	

Parameters of DNX

Output voltage		*110V*			*220V*		
Type		DNX7078 0336.xxxx	DNX7156 0636.xxxx	DNX7234. 0936.xxxx	DNX8042. 0336.xxxx	DNX8084. 0636.xxxx	DNX8126. 0936.xxxx
Input	**Input voltage**	**3 x 230 V**					
	Range of input voltage	**170 – 275 V *(275 – 300 V)**					
	Max. input current	**3 x 20 A**	**3 x 40 A**	**3 x 60 A**	**3 x 20 A**	**3 x 40 A**	**3 x 60 A**
Output	**Max. output power**	**10800 W**	**21600 W**	**32400 W**	**10800 W**	**21600 W**	**32400 W**
	Max. output current	**78 A**	**156 A**	**234 A **200 A**	**42 A**	**84 A**	**126 A**
	Range of output voltage	**10 – 140 V**			**10 – 260 V**		
Configuration	**Number of racks for modules (RACK 3xD)**	**1**	**2**	**3**	**1**	**2**	**3**
	Max. number of modules Dxxxyyy	**3**	**6**	**9**	**3**	**6**	**9**
	Max. number of control units MDR	**1**	**2**	**3**	**1**	**2**	**3**
	Max. number of dispay units MDL	**1**	**2**	**3**	**1**	**2**	**3**
	Dim. [mm] width height depth	**483 178 (4U) 505**	**483 356 (8U) 505**	**483 534 (12U) 505**	**483 178 (4U) 505**	**483 356 (8U) 505**	**483 534 (12U) 505**
	Weight [kg]						

Extensions		*MBZ200110xy*					*MBZ200220xy*				
		x			*y*		*x*			*y*	
	Module for operation in battery power supply mode	**C**	**D**	**E**	**1**	**2**	**C**	**D**	**E**	**1**	**2**
	Number of bat. sets				**1**	**2**				**1**	**2**
	Electronic. ByPass	**Yes**	**No**	**No**			**Yes**	**No**	**No**		
	Bat. disconnecter LVD	**Yes**	**Yes**	**No**			**Yes**	**Yes**	**No**		

* does not work in this range, but there will be no damage on the equipment.

** max. output current for DNX with MBZ module

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System **DNX xxxx.xxxx.xxxx**

Input

- voltage 3 x 230 VAC
- protection external in cubicle 20 A – each module
- MU105 – protection of modules against high input voltage – OPTION

Output

- nominal voltage 110 / 220 V
- max. operating range of output voltage 10 ÷ 140 / 10 ÷ 260 V
- max. output current 234 A (mode of power supply, charger)
- max. output current 200 A (battery mode with module MBZ)
- max. 2 battery strings with external protection in cubicle max. 200 A
- battery protection against deep discharge – battery disconnecter (with module MBZ)
- protection against output overvoltage
- thermal sensor - battery (compensating)
- shunts for current measurement from (into) batteries – part of module MBZ

Safety

- STN EN 60 950

Insulation strength

- input – output – 4kV

EMC

- resistance STN EN 61 000 6 - 2
- emission STN EN 61 000 6 - 4

Covering

- IP00

Control and monitoring functions

- input mains status
- input protection against overvoltage - OPTION
- output voltage
- output current into load
- full monitoring of digital power DC modules
- status of breakers and fuses
- battery voltage
- charging current into batteries
- current from batteries at back-up
- battery temperature
- battery status
- thermal compensation of battery voltage
- disconnecting of batteries at low voltage
- limitation of battery charging current
- charging characteristics U,IU, IUoU and USER
- programmable battery test
- communication with user
  - Relay contacts - 6x
  - USB
  - SNMP or LAN adapter – built-in (option)
- visual alarms signalling
- sound signalling
- events history - 1000 records

Display module

- LCD panel 2 x 24 characters
  MDL001 – version on door
  MDL002 – version 19“ (height 1U)

Dimensions (wxdxh)

- depends on specification

Weight

- depends on specification

Cooling

- forced air flow

Range of temperatures

- operating -10 ÷ 55 °C
- storage -35 ÷ 85 °C

Power modules in 19“ racks are dedicated to build in 19“ cubicles. Cooling of cubicles is forced – air flow from front side to rear side. Front and rear door are perforated and there has to be ensured adequate space for air circulation. Batteries can be provided as internal inside system cubicle, or external in battery cubicle or shelf. Connection of input and output cables to system DNX is made from the bottom side of the cubicle.

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