



## DC/DC converters TESZ500 series



### Features

- Class: Industrial
- Cases with mounting flanges; or copper case (optional)
- Parallel operation
- Feedback from load
- Output current up to 30 A, output power 500 W; one output channel
- Input voltage ranges: 14,4...36 VDC, 21...54 VDC, 28...72 VDC, 43...108 VDC, 57...144 VDC, 66...165 VDC
- Protection against input overvoltage and surges according to EN50121-3-2, EN50155, IEC60571, RIA12
- Power density up to **1691** W/dm<sup>3</sup>
- Low profile 16 mm design
- Case operating temperature range: -40°C...+85°C
- Magnetic feedback without optocouplers
- Output voltage adjustment, remote on/off
- Max capacitance 10000 µF for U<sub>out</sub>=24 VDC

### Description

**DC/DC converters with protection from transient voltage surges on the input** are especially designed for industrial applications and harsh environment operation. Modules are perfect for power systems mobile and stationary objects, powered by a generator. Modules are able to operate in a wide temperature range (-40...+85°C). The absence of optocouplers in the converter's circuit allows it's operation in conditions of ionizing radiations and high temperature during units entire lifetime. These modules can be switched on/off by a signal, have full protection complex against over current, shorting and overheating and can be connected in parallel or in series.

These modules are built using specially designed electronic components and sealed with heat-conducting potting material. They have wide operating temperature range and a thermal protection chip. These modules undergo special thermal and limit tests, including burn-in-tests with extreme on/off modes. They are available in metal cases with mounting flanges.

An operating unit can withstand drop of input voltage in relation to the normal input voltage, and in many cases the module is able to provide needed output power when the input voltage decreases 10-30% compared to the normative.

Upon customers' request this modules can be produced in copper cases (covered by "Black chrome"), allowing its installation on aluminum heat sink and providing a positive effect on the modules EMC and heat transfer.

## Ordering information

### TESZ 500 - 110Z S 24 - U N

1 2 3 4 5 6 7

- 1 - «TESZ» Series
- 2 - Max output power, W
- 3 - Input voltages
  - 24 Z – 24 VDC (14,4...36 VDC)
  - 36 Z – 36 VDC (21...54 VDC)
  - 48 Z – 48 VDC (28...72 VDC)
  - 72 Z – 72 VDC (43...108 VDC)
  - 96 Z – 96 VDC (57...144 VDC)
  - 110 Z – 110 VDC (66...165 VDC)
- 4 - Index of output channels quantity
  - S – one
- 5 - Nominal output voltage, VDC (two signs for a channel)
- 6 - Index of case design
  - U – metal case with flanges
- 7 - Index of operating temperature range of the case
  - N –40°C...+85°C

## Technical information

### Standard models with one output

Module	Input voltage range	Output power	Output voltage / nominal output current	Typical efficiency
TESZ500-24ZS24-UN	14,4...36 VDC	500 W	24 VDC / 20,8 A	83%
TESZ500-24ZS27-UN	14,4...36 VDC	500 W	27 VDC / 18,5 A	83%
TESZ500-24ZS48-UN	14,4...36 VDC	500 W	48 VDC / 10,4 A	83%
TESZ500-36ZS24-UN	21...54 VDC	500 W	24 VDC / 20,8 A	84%
TESZ500-36ZS27-UN	21...54 VDC	500 W	27 VDC / 18,5 A	84%
TESZ500-36ZS48-UN	21...54 VDC	500 W	48 VDC / 10,4 A	84%
TESZ500-48ZS24-UN	28...72 VDC	500 W	24 VDC / 20,8 A	85%
TESZ500-48ZS27-UN	28...72 VDC	500 W	27 VDC / 18,5 A	85%
TESZ500-48ZS48-UN	28...72 VDC	500 W	48 VDC / 10,4 A	85%
TESZ500-72ZS24-UN	43...108 VDC	500 W	24 VDC / 20,8 A	86%
TESZ500-72ZS27-UN	43...108 VDC	500 W	27 VDC / 18,5 A	86%
TESZ500-72ZS48-UN	43...108 VDC	500 W	48 VDC / 10,4 A	86%
TESZ500-96ZS24-UN	57...144 VDC	500 W	24 VDC / 20,8 A	88%
TESZ500-96ZS27-UN	57...144 VDC	500 W	27 VDC / 18,5 A	88%
TESZ500-96ZS48-UN	57...144 VDC	500 W	48 VDC / 10,4 A	88%
TESZ500-110ZS24-UN	66...165 VDC	500 W	24 VDC / 20,8 A	88%
TESZ500-110ZS27-UN	66...165 VDC	500 W	27 VDC / 18,5 A	88%
TESZ500-110ZS48-UN	66...165 VDC	500 W	48 VDC / 10,4 A	88%

Modules with non-standard output voltage from 15 to 80 VDC with maximal output current up to 30 A, could be delivered by request.

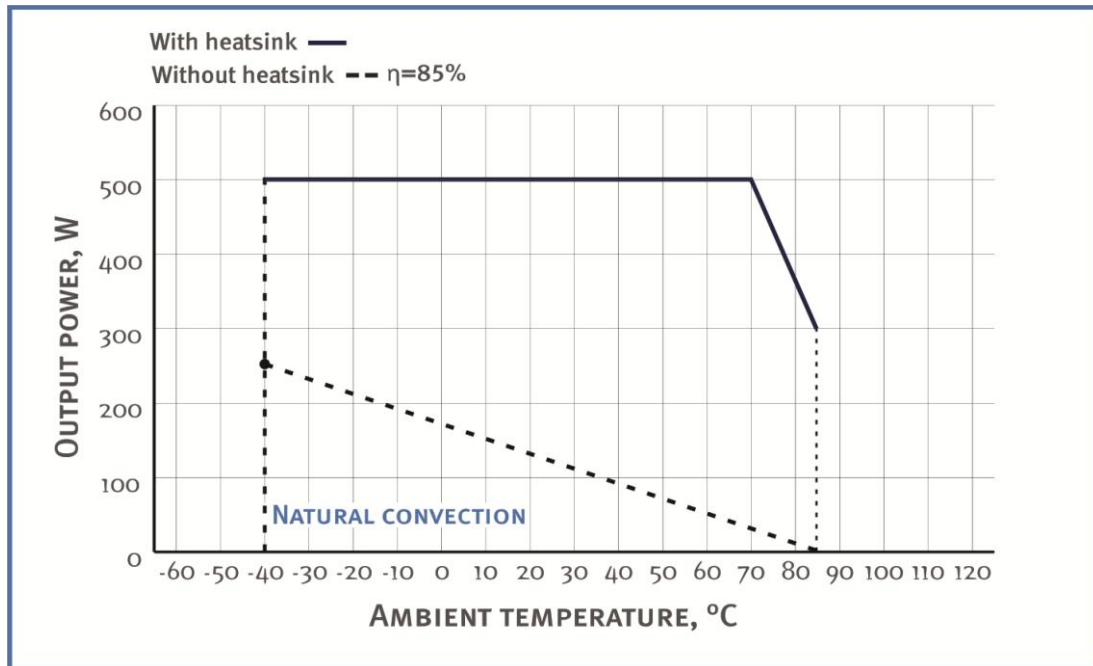
## Specifications for DC/DC converters TESZ500 series\*

<b>Input specifications</b>	
Input voltage range 24 Z	=14,4...36 VDC
Input voltage range 36 Z	=21...54 VDC
Input voltage range 48 Z	=28...72 VDC
Input voltage range 72 Z	=43...108 VDC
Input voltage range 96 Z	=57...144 VDC
Input voltage range 110 Z	=66...165 VDC
<b>Surge and transient protection ***</b>	
Input surge protection 24 Z	84 VDC @ 20 ms trise=tfall = 2 ms, Rsource=0,2 Ω
Input surge protection 36 Z	126 VDC @ 20 ms trise=tfall = 2 ms, Rsource=0,2 Ω
Input surge protection 48 Z	168 VDC @ 20 ms trise=tfall = 2 ms, Rsource=0,2 Ω
Input surge protection 72 Z	252 VDC @ 20 ms trise=tfall = 2 ms, Rsource=0,2 Ω
Input surge protection 96 Z	336 VDC @ 20 ms trise=tfall = 2 ms, Rsource=0,2 Ω
Input surge protection 110 Z	385 VDC @ 20 ms trise=tfall = 2 ms, Rsource=0,2 Ω
<b>Input transient protection ****</b>	
Input transient protection 24 Z, 36 Z, 48 Z, 72 Z, 96 Z, 110 Z	Umax=960 V trise=10 μs, tduration=100 μs@0,5 Umax Rsource=5Ω
	Umax=1800 V trise=5 μs, tduration=50 μs@0,5 Umax Rsource=5Ω
	Umax=3600 V trise=0,5 μs, tduration=5 μs@0,5 Umax Rsource=100Ω
	Umax=4800 V trise=0,1 μs, tduration=0,1 μs@0,5 Umax Rsource=100Ω
	Umax=8400 V trise=0,05 μs, tduration=0,1 μs@0,5 Umax Rsource=100Ω
Input filter	In accordance with EN50121-3-2, EN50155
<b>Output specifications</b>	
Output voltage adjustment	±5% Uout nom.
Instability of output voltage in accordance to changing of output current from 10 to 100% for single output model	±6%
Ripple and noise (peak-to-peak) (20 MHz)	<2% Uout nom.
Short circuit protection**	auto repair
Overvoltage protection**	<150 % Uout nom.
Over current protection level**	Pout ... 1.8·Pout
Remote On/Off	Shuts down outputs by applying 0...1,1 VDC or connection of output «ON» and «- IN», I≤5 mA
The maximum output power without the heatsink, Tamb=50°C	74 W
<b>General specifications</b>	
Case temperature (operating)	-40°C ...+85°C ***
Case temperature (storage)	-40°C ...+85°C
Case temperature power decrease (natural convection)	See diagram (dashed, dash-dotted curve)
Case temperature without power decrease with heat sink	See diagram (solid curve)
High humidity	100% @35 °C
Thermal resistance case — environment without heat sink	2,7 °C/W
Conversion frequency	200 kHz typical
Insulation voltage input/output	~3000 VAC
Insulation voltage input/case	~1500 VAC
Insulation voltage output/case	~500 VAC
Isolation resistance @ 500 VDC	>20 MOhm
EMC standards	EN 55022, class A with additional filter
Safety standard	IEC/ EN 60950,

Surge and Transient Protection	EN50155, IEC60571, RIA12
Typical MTBF (Tcase = 50°C; Pout = 0,7 Pout max)	50 000 hrs
Cooling metod	Free air convection or forced air cooling
Weight (max)	500 g

- \* All specifications are valid for normal climatic conditions, Uin.nom., Iout.nom., unless otherwise stated.
- \*\* Parameters are stated for the information purposes and could not be used at long term work, exciding maximum output current, at work outside of a range of operating temperatures.
- \*\*\* Surges and transients may be assumed to be non-repetive, and They should not ..... at time interval at less than 10 second.
- \*\*\*\* For capatitor discharge voltage transient test.

**Output power vs an ambient temperature at  
input voltage =28...72 VDC**

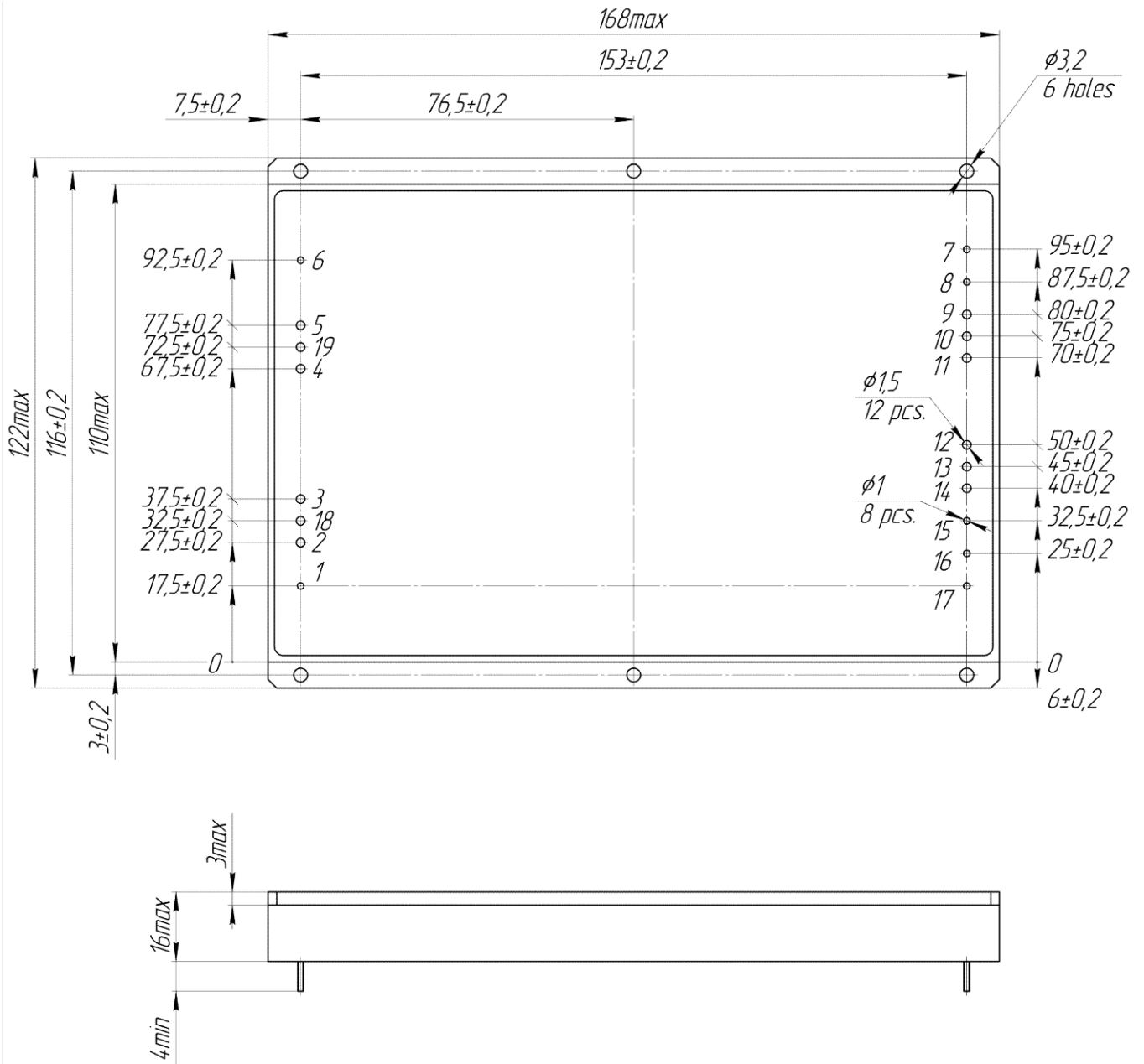


Dropping parts of the dashed curve is in accordance with the **maximum temperature of the case**. Output power must not exceed the values which are limited by corresponding curve for a given ambient temperature.  
 Modules can be used without a heat sink only when screwing them heat conductive plate with thermal paste and with the length and width not less than case size and thickness of not less than 4 mm.

### Pin Out

No Pin	1	2,3,18	4,5,19	6	7	8	9,10,11	12,13,14	15	16	17
Single output	ON	-IN	+IN	CASE	DIAG	+RS	+OUT	-OUT	-RS	ADJ	PARAL

### Single output model with ganges (VIII case type)



## Certificates

Certificate ISO\*  
CE conformity declaration

\*Management system of Alexander Electric is ISO certified

## Note

The label can be placed on the top surface of the module and must be removed before installation.

Please, note that all information in this material is for reference only. Further detailed information (including: additional requirements, manuals and circuit schemes) is found on our website <http://www.teslaelectric-eu.com>.

## Pricing information

CPT-Distributor price for ordering batch more than 251pcs: 439€.

Please, contact our distributors within your location for more information about pricing options.

## Contact information

<http://www.teslaelectric-eu.com>, e-mail: [contact@teslaelectric-eu.com](mailto:contact@teslaelectric-eu.com), phone/fax: +420 266 107 303

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