

Series UXP®-600

600 W resistor, US Patent-No. 5,355,281



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For variable speed drives, power supplies, control devices, robotics, motor control and other power designs, the easy mounting fixture assures an auto-calibrated pressure to the cooling plate of about 300 N.

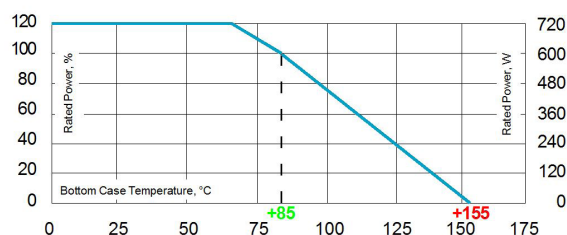
Features

- 600 W operating power
- Non-Inductive design
- ROHS compliant
- High insulation & partial discharge performance
- Materials in accordance with UL 94 V-0
- Thermal interface management available (ask for details)



Technical Specifications

Resistance value	$\geq 0.03 \Omega \leq 1.5 \text{ M}\Omega$ (higher values on request)
Resistance tolerance	$\pm 5 \%$ to $\pm 10 \%$ $\pm 1 \%$ to $\pm 2 \%$ on special request for limited ohmic values with the reduction of the max. power / pulse rating (ask for details)
Temperature coefficient	$\pm 500 \text{ ppm}/^\circ\text{C}$ ($0.1 \Omega \leq 0.2 \Omega$) standard $\pm 150 \text{ ppm}/^\circ\text{C}$ ($> 0.2 \Omega \leq 1.5 \text{ M}\Omega$) standard lower TCR on special request for limited ohmic values
Power rating	600 W at 85°C bottom case temperature
Short time overload	1,000 W at 70°C for 10sec., $\Delta R = 0.4\%$ max.
Maximum working voltage	5,000 V DC $\approx$ 3,500 V AC RMS (50 Hz) higher voltage on request, not exceeding max. power
Maximum continuous current	150 A (HC or UHC version)
Electric strength voltage	7 kVrms / 50 Hz / 500 VA, test time 1 min. between terminal and case (up to 12 kVrms on request) voltages above 10 kVrms are tested at DC equivalent to avoid pre damage of component
Partial discharge	4 kVrms < 10 pC (up to 7 kVrms < 10 pC on request) acc. to IEC 60270
Peak current	up to 1,500 A depending on pulse length and frequency (ask for details)
Insulation resistance	> 10 G Ω at 1,000 V
Single shot voltage	up to 12 kV norm wave (1.5/50 μsec)
Creeping distance	> 42mm (standard, higher on request)
Air distance	> 14mm (standard, higher on request)
Inductance	$\leq 80 \text{ nH}$ (typical), measuring frequency 10 kHz
Capacity/mass	$\leq 110 \text{ pF}$ (typical), measuring frequency 10 kHz
Capacity/parallel	$\leq 40 \text{ pF}$ (typical), measuring frequency 10 kHz
Operating temperature	-55°C to +155°C
Mounting - torque for contacts	1.8 Nm to 2 Nm
Mounting - torque	1.6 Nm to 1.8 Nm M4 screws
Internal temperature sensor available on request	PT-1000 / PT-100 / Type K / Type J (ask for details)
Cable variation available on request	HV-cable / Flying leads (ask for details)
Standard cable Type	H&S Radox 9 GKW AX 1,5mm ² (other cable types on special request)
Weight	~120 g



Derating (thermal resist.) UXP®-600: 8.33 W/K (0.12 K/W)

Power rating: 600 W at 85°C bottom case temperature*

Please ask for detailed mounting procedure!

* This value is only applicable when using a thermal conduction to the heat sink $R_{th-cs} < 0.025 \text{ K/W}$. This value can be obtained by using a thermal transfer compound with a heat conductivity of at least 1 W/mK. The flatness of the cooling plate must be better than 0.05 mm overall. Surface roughness should not exceed 6.4 μm .

General Specifications

Electric support

Alumina ceramic metalized with Miba Resistors ALTOX film on the bottom for improved heat transfer and optimum discharge

Encapsulation

Resin-filled epoxy casing with large creeping distance to mass, large air distance between the terminals and high insulation resistance (CTI 600)

Resistance Element

Special design for low inductance and capacitance values. The element employs our special METOXFILM, which demonstrates stability while covering high wattage and pulse loading

Housing

Housings are made without color additives. The color definition is natural and can vary in different pigmentation

Contacts

- Easy load connection with M4 and M5 screws (Inch thread terminals on request)
- Connector height available from 25 to 42 mm
- Various sleeves for increasing creeping distance up to 85 mm or potted cable connections are available on request
- Contacts standard M5 (M4 on special request - connection screw thread max. 7 mm)

The above spec. sheet features our standard products. For further options please contact your local Miba Resistors representative.

sales.mra@miba.com · US: sales@miba-resistors.com

Miba Resistors former



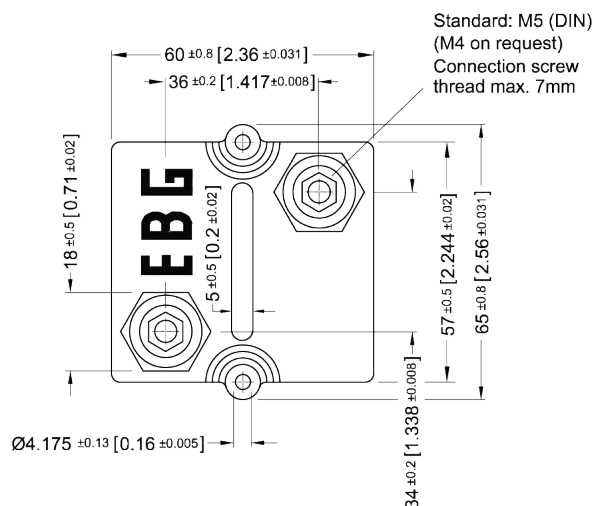
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Dimensions in mm [inches]



How to make a request

■ Standard terminal

UXP-600_Ohmic Value_Tolerance_Terminal Height_Contact

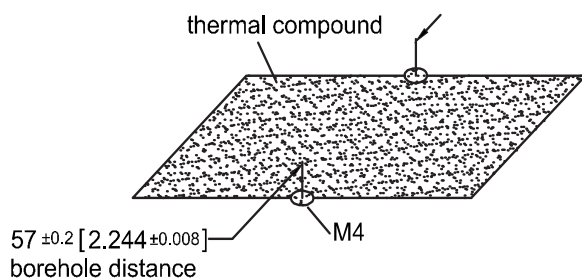
For example

UXP-600 5R 10% 30/32 M5

■ Examples for optional terminals

UXP-600 5R 10% 25/25 M5 or UXP-600-7 5R 10%

Borehole Distance



Test Specifications*

Test	Method	Tolerance Drift**
Short time overload	1,000 W/10sec.	0.40%
Humidity steady state	56 days/40°C/95%	0.25%
Temp. Cycling	-55/+125/5cycles	0.20%
Shock	40g/4,000 times	0.25%
Vibrations	2-500Hz/10g	0.25%
Load life 3,000cyl	PN 30 min. on / 30 min off	0.40%
Terminal strengths	200 N for hexa. thread contacts	0.05%

Please note most all of our UXP customers have their own custom designed drawing. Therefore please do not hesitate to discuss your special needs with the local representative or contact us directly.

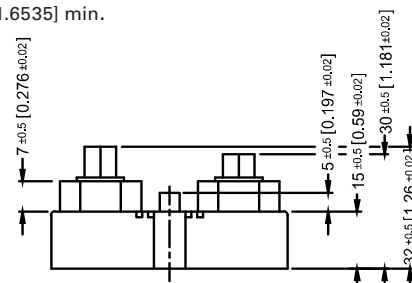
Standard Terminals

Air distance: 14mm [0.5512] min.

Creeping distance: 42mm [1.6535] min.

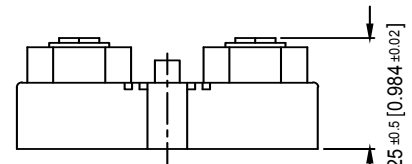
Terminal height 30/32

Standard



Terminal height 25/25

Optional



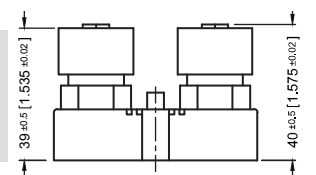
Terminal Options (for increased air & creeping distances)

Other terminal dimensions available, contact for more information

UXP-600-9

Air distance: 25mm [0.984] min.

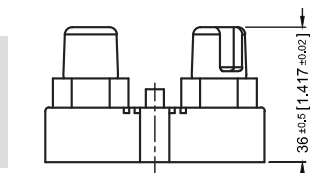
Creeping distance: 83mm [3.267] min.



UXP-600-7

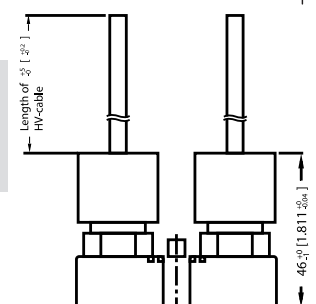
Air distance: 26.7mm [1.0512] min.

Creeping distance: 50mm [1.968] min.



UXP-600-16

Air and creeping distance depends on length of HV-cable



* The test methods are according to IEC 60068-2

** The tolerance drift is the possible change of the resistance value because of the certain test

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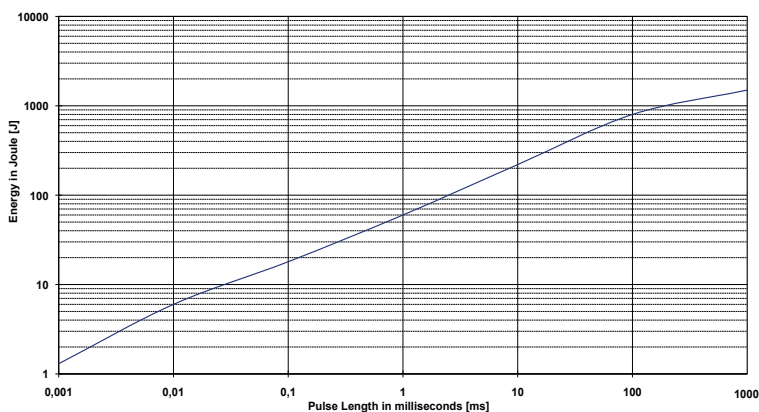
Pulse Energy Curve (typical rating for UXP-600 with 10R and 10 % tolerance)

Note: These energy values are reference values, depending on ohmic value and used resistive paste, a variation in max. energy load capability is possible

Test procedure

Every test resistor was mounted with thermal compound (0.9 W/mK) on a water cooled heatsink

- Constant inlet water temperature: +50°C
- The test time of each tested resistor: 10min.
- Break time between two pulses: 1sec.
- To determine good / defect parts the ohmic value was measured before and after tests:
a change of tolerance of more than 0.1% means defect



Description of Pulse Energy Curve

- Shape of pulse = e-function
- Time between two pulses = 1 second
- Pulse length = time constant of 1 tau
(1 means ... tau = 1ms)

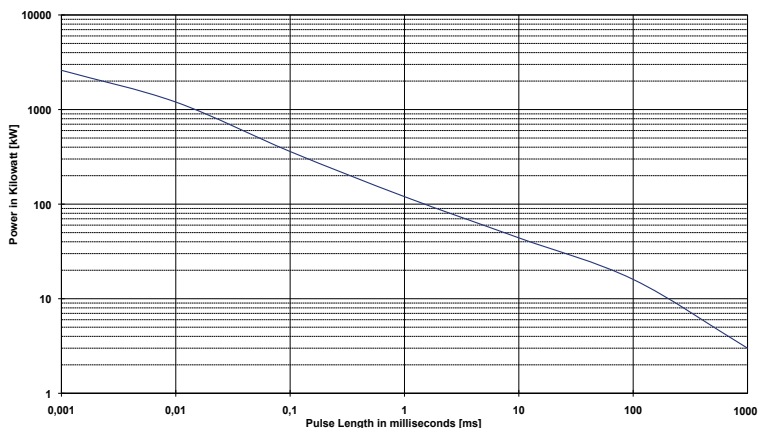
Example

At 1 ms tau the UXP-600 with 10R can withstand an energy level of about 60 J, when the pulse pause time is ≥ 1 s

At a symmetrical frequency > 1 kHz at pulse length ≥ 10 μ sec. the maximum applied pulse energy for UXP-600 is a result out of the nominal power 600 W divided by the operating frequency (at 85°C bottom case) ($E = 600 \text{ W} / F$)

Pulse Power Curve (typical rating for UXP-600 with 10R and 10 % tolerance)

The power curve shows the max. possible power which can be applied for a certain duration. Referring to the same test procedure as described above.



Description of Pulse Power Curve

- Shape of pulse = e-function
- Time between two pulses = 1 second
- Pulse length = time constant of 1 tau
(1 means ... tau = 1ms)

Example

For the time-constant of 1 ms you can apply about 120 kW max. ($P_p = 2 \cdot E / T$) $\rightarrow$ if the time between two such peaks is ≥ 1 s

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