

A Miba Group Company

Ultra-High-Power Resistors

Series UXP-600

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

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 120 to 160 N.

- 600 W operating power
- Tolerance range ±10 % to ±5 % (tighter on special request)
- Ohmic range 0.1 Ω to 1.5 M Ω (higher value on special request)
- Non-Inductive design
- ROHS compliant
- High insulation & partial discharge performance
- Materials in accordance with UL94-V0



Technical Specifications

 $\begin{array}{l} 0.1~\Omega \leq 0.2~\Omega~\text{(HC-version)} \\ > 0.2~\Omega \leq 1.5~M\Omega~\text{(higher value on special request)} \end{array}$ Resistance value

Resistance tolerance

+ 10% to + 5% \pm 2% to \pm 1% on special request for limited ohmic value with the reduction of the max. power / pulse rating (ask for details)

Temperature coefficient

 ± 500 ppm/°C (0.1 $\Omega \le 0.2~\Omega)$ Standard ± 150 ppm/°C (> 0.2 $\Omega \le 1.5~M\Omega)$ Standard lower TCR on special request for limited ohmic value

Power rating Short time overload Maximum working voltage

600 W at 85°C bottom case temperature 1,000 W at 70°C for 10sec., $\Delta R = 0.4\%$ max.

Electric strength voltage

7 kVrms / 50 Hz / 500 VA, test time 1 min.

(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) > 10 GΩ at 1,000 V

Insulation resistance Single shot voltage

up to 12 kV norm wave (1.5/50 µsec)

Creeping distance Air distance

> 42mm (standard, higher on request) > 14mm (standard, higher on request)

Inductance Capacity/mass

≥ 80 nH (typical), measuring frequency 10 kHz ≥ 110 pF (typical), measuring frequency 10 kHz

Capacity/parallel

≥ 40 pF (typical), measuring frequency 10 kHz

Operating temperature

-55°C to +155°C

Mounting - max. torque for contacts Mounting - max. torque

1.8 Nm M4 screws

2 Nm

Contacts

standard M5 (M4 on special request) connection screw thread max. 7mm

Internal Temperature Sensor

PT-1000 / PT-100 / Type K / Type J

Cable variation

HV-cable / Flying leads (ask for details)

Weight ~120 g

General Specifications

Electric support

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

Encapsulation

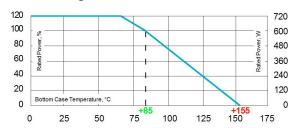
Resin-filled epoxy casing with large creeping distance to mass, large air distance between the terminals and high insulation resistance (CTI 600)

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

- Easy load connection with M4 and M5 screws (Inch thread terminals on
- 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

Power Rating



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.

Derating (thermal resist.) UXP-600 8.33 W/K (0.12K/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 Rth-cs<0.025 K/W. This value can be obtained by using a thermal transfer compound with a heat conductivity of 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

The above spec, sheet features our standard products. For further options please contact our local EBG representative or contact us directly

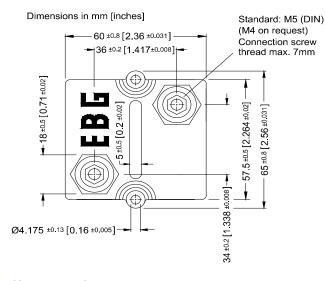


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Dimensions



How to make a request

Standard terminal

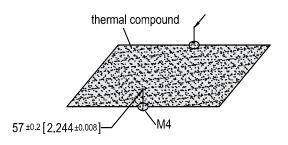
UXP-600_Ohmic Value_Tolerance_Terminal Height_Contact

For example UXP-600 5R 10% 30/32 M5

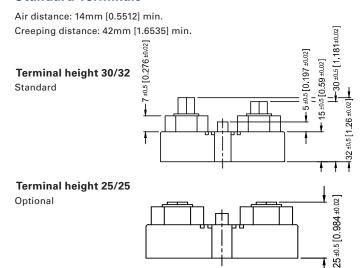
■ Examples for optional terminals

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

Borehole Distance

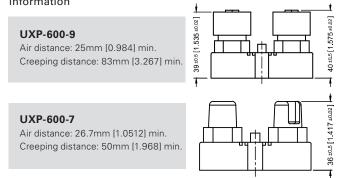


Standard Terminals



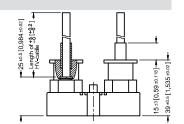
Terminal Options (for increased air & creeping distances)

Other terminal dimensions available, contact for more information



UXP-600-8

Air and creeping distance depends on length of HV-cable



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 f. contacts	200N	0.05%

^{*} The test methods are according to IEC 60068-2

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



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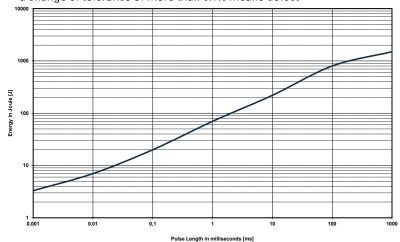
Pulse Energy Curve (typical rating)

Empirical tested at a UXP-600 3R2 10% resistor. The energy capability will vary depending on the ohmic value of the resistor

Test procedure

Every test resistor was mounted with thermal compound (0.9W/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 [ms] = time constant of 1 tau (1 means tau = 1ms)

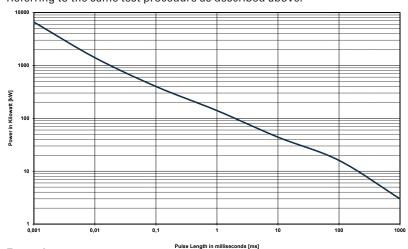
Example

At 0.1ms tau the UXP-600 with 3R2 can withstand an energy level of 20J when the pulse pause time is ≥ 1s

At a symmetrical frequency > 1 kHz at pulse length ≥ 10 µsec. 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 W / F)

Power Curve (typical rating)

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 Energy Curve

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

Example

For the time-constant of 10ms you can apply about 40kW, if the time between two such peaks is ≥ 1s