

Energizing Productivity

Electric boats

Situation:

Modern electric boats glide emission-free and almost noiselessly across the water. The drive controller is powered by a battery storage system. This supplies the motor for the main drive with the necessary energy and is also the energy source for the entire on-board power supply.

Problem:

The drive controller can't be started directly from the battery storage system.

Intention:

The drive controller should be started with a precharging resistor,

so that problem-free operation of the electric boat with the battery storage is made possible.

Solution:

- > The [PTC800666](#) resistor with self-protecting PTC thermistor element in aluminum housing with very high operating voltage and IP 20 degree of protection starts the drive controller, which is then supplied with the necessary energy from the battery storage system.



Results:

1. Without the resistor, the drive controller and therefore the ship's engine cannot be started.



Enable starting of the drive controller

Further information:

[Electric-boats](#)

We look forward to hearing from you!

Safe brake resistor in PTC technology PTC8006x

Self-protecting PTC element (aluminum housing) with very high operating voltage limit; protection class IP20.



Rated power (W)
See tables

Resistance values (Ohm)
See tables

Dimensions (mm)
Enclosure: See tables
Wiring: up to 450 mm
Ø AWG 20 or 0.51 mm²
FEP isolated,
UL Style 1901

With four mechanical and electrical ranges of 35, 70, 105 and 140 watts continuous power on a heat sink, the PTC brake resistors cover the power requirements of small frequency inverters and servo controllers. Similar to the level of wire-based brake resistors, the impulse power ratings are of major importance for the applications and have a factor of 35 with a 1 percent duty cycle. The elements which may be installed in the inverter's enclosure are also known as ballast resistors and have an IP20 protection class. Several mechanical designs are available in the series. Customer requirements are implemented as necessary when the order involves sufficient quantities. The resistance values for each type are dynamic with respect to the temperature at the PTC (see R(T) curve) and the applied voltage.

Technical specifications (θ_A = 20°C, unless otherwise stated)

Parameter	Symbol	Value	Unit	Conditions
Tolerance (resistance)		± 35	%	Caution: Typical for thermistors and not reducible
Max. perm. operating voltage	U _B	≤ 600 AC	V	according to CSA
		≤ 848 DC	V	
Threshold limit voltage DC	U _{BD}	1300 (1750 Ohm)	V	Caution: Abruptly low resistance (reaction like a short circuit)
		1100 (350 Ohm)	V	
		900 (175 Ohm)	V	
Isolation voltage ¹	U _{ISO}	≥ 4000 AC	V	f = 50 Hz; t = 1 s
Surface temperature at constant load with U _N	T ₀	175 ± 10K	°C	The temperature will stay within the tolerance at a constant load of 500VAC
Transiston temperature	CP	140	°C	Depending form the material, describes the temperature at which the resistance reaches two times the rate of its lowest value
Cold resistance at 25°C	R ₂₅	s. Page 3	Ω	Caution: Dynamic value, depending on the temperature of the PTC! (cf. the characteristic curve of R(T)) and the applied voltage!
Energy consumption	E	s. Page 3	J (Ws)	at 1.2s (1% ED)
Pulse rating	P _i	≤ 20	kW	Value in Approximation
Storage temperature	θ _s	-25 ... +85	°C	
Certifications	cCSAus			acc. to standard CSA-C22.2 and UL 508



Versions



PTC



PTC with connector



PTC with customer specific connector

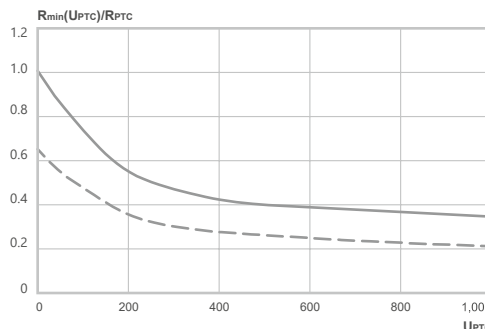


PTC with customer specific connector

¹Period spikes against the grounded resistor housing (PE) must not exceed 700 VDC, otherwise the housing must be isolated from PE and finger safe installed.

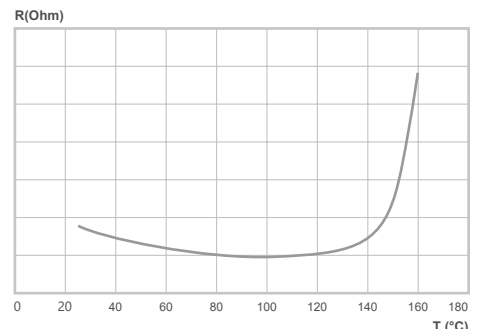
Resistance-Voltage-Characteristic

Brake resistor PTC8006xx
Type specific of request
— at 25 °C - - - at 90 °C



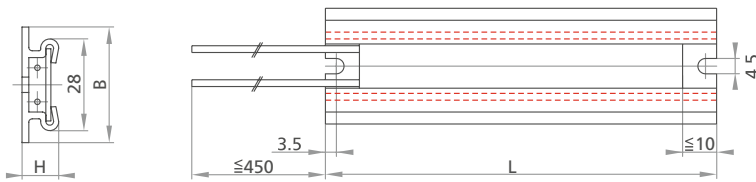
Case temperature

Brake resistor PTC8006xx
Resistance-temperature characteristic
Type specific of request



We look forward to hearing from you!

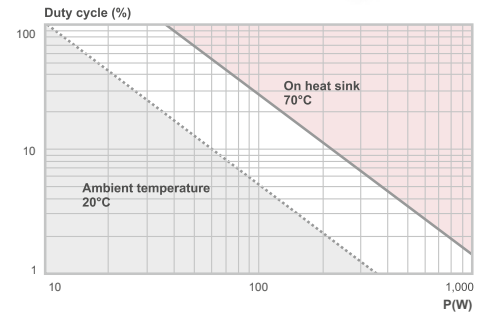
Dimensions and mounting holes (mm)



PTC - 35 W ($\vartheta_A = 20^\circ\text{C}$, unless otherwise stated)

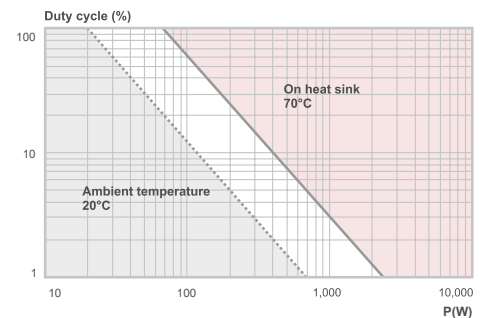
Parameter	Symbol	Value	Unit	Conditions
Resistances	R	175, 350, 1750	Ω	²
Rated power	P	10	W	unobstructed convection
		35	W	on heat sink (70 °C)
Dimensions	L	59.5	mm	no mounting holes ³
		73.0	mm	
		89.0	mm	
	W	34.0	mm	
	H	10.7	mm	alternatively
Energy consumption	E	660	J (Ws)	at 1,2s (1% ED)

Impulse loading



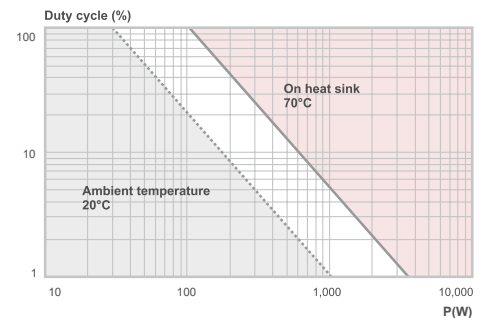
PTC - 70 W ($\vartheta_A = 20^\circ\text{C}$, unless otherwise stated)

Parameter	Symbol	Value	Unit	Conditions
Resistances	R	90, 175, 875	Ω	²
Rated power	P	20	W	unobstructed convection
		70	W	on heat sink (70 °C)
Dimensions	L	100.0	mm	³
		115.0	mm	
		34.0	mm	
	H	10.7	mm	
	Energy consumption	E	960	J (Ws)



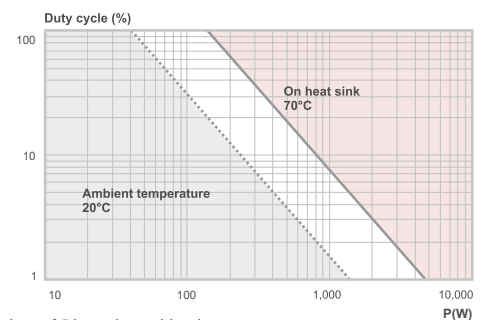
PTC - 105 W ($\vartheta_A = 20^\circ\text{C}$, unless otherwise stated)

Parameter	Symbol	Value	Unit	Conditions
Resistances	R	60, 120	Ω	²
Rated power	P	30	W	unobstructed convection
		105	W	on heat sink (70 °C)
Dimensions	L	139.0	mm	³
	W	34.0	mm	
	H	10.7	mm	
Energy consumption	E	1320	J (Ws)	at 1,2s (1% ED)



PTC - 140 W ($\vartheta_A = 20^\circ\text{C}$, unless otherwise stated)

Parameter	Symbol	Value	Unit	Conditions
Resistances	R	44, 88, 437,5	Ω	²
Rated power	P	40	W	unobstructed convection
		140	W	on heat sink (70 °C)
Dimensions	L	167.0	mm	³
	W	34.0	mm	
	H	10.7	mm	
Energy consumption	E	2160	J (Ws)	at 1,2s (1% ED)



² The resistance values for each type are dynamic with respect to the temperature at the PTC (see R(T) curve) and the applied voltage. ³ Dimensions with tolerances

We look forward to hearing from you!



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