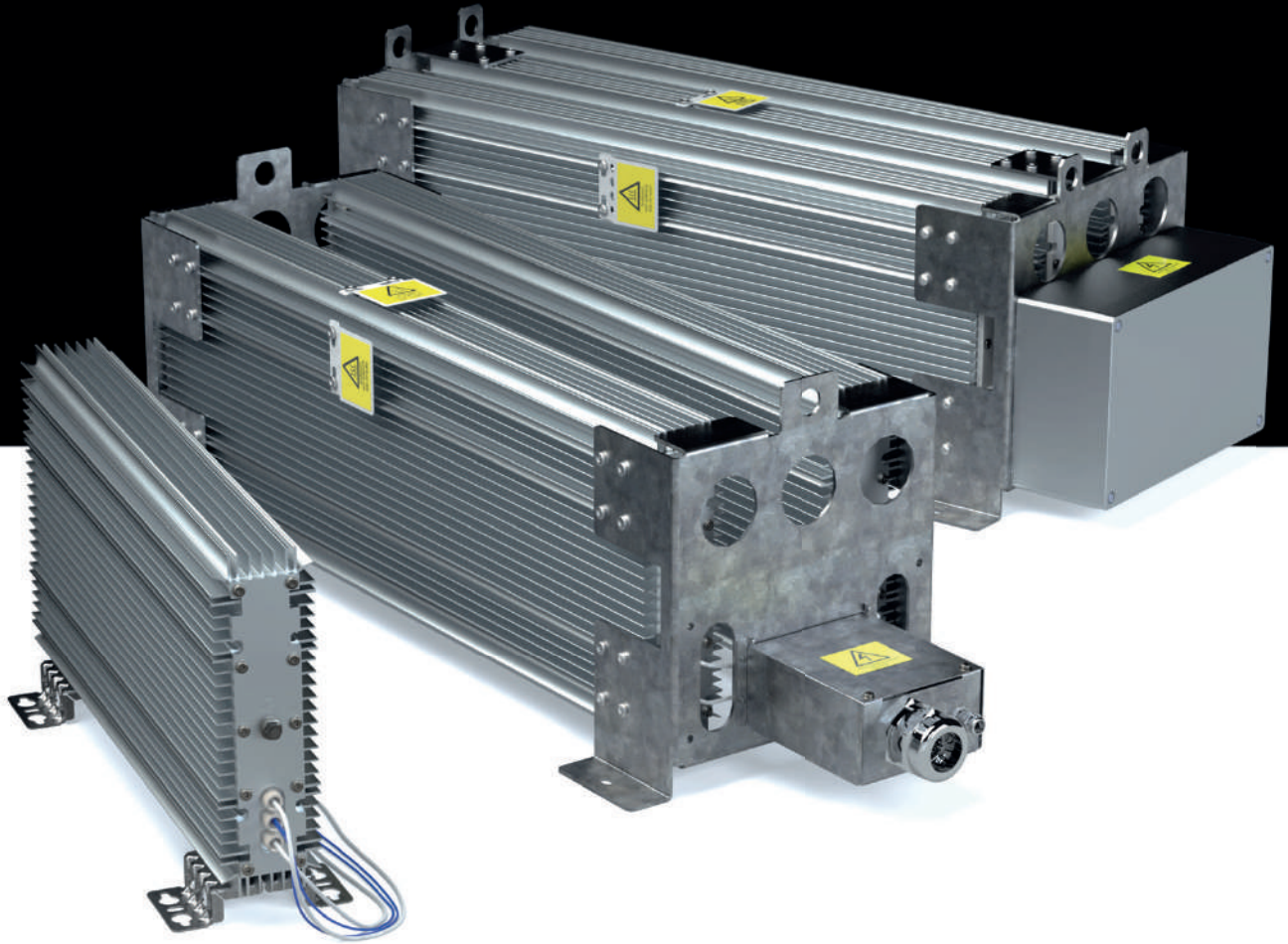




DANOTHERM™



CBT-H / CBT-V

# Housings	Nominal power [W] @ 40°C according UL0508							Single housing R [Ω] min-max
	Single housing				2 housings	3 housings	4 housings	
	no thermal switch		thermal switch		no thermal switch			
Length / Type	CBT *	CBT	CBT *	CBT	CBT	CBT	CBT	
CBT 180	380	455	380	380				0.04 - 13
CBT 210	520	585	520	520				0.05 - 2000
CBT 260	760	850	750	750				0.07 - 2000
CBT 330	1100	1350	1100	1100				0.09 - 2000
CBT 400	1440	1650	1440	1440	1920	2610	3490	0.11 - 2000
CBT 460	1730	1900	1725	1725	2540	3810	5080	0.14 - 2000
CBT 560		2310		2095	3170	4710	6250	0.18 - 110
CBT 660		2720		2470	3810	5720	7620	0.22 - 130
CBT 760		3200		2905	4530	6530	8710	0.27 - 150
CBT 860		3640		3305	4990	7260	9800	0.31 - 180
CBT 960		4070		3695	6260	8170	10890	0.35 - 220

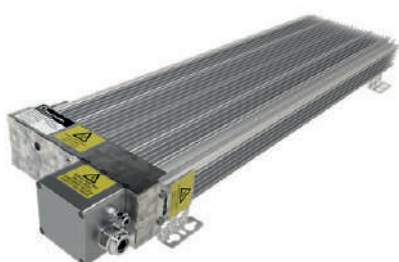
* CBT for high Ohm values
See nomenclature page 64

Construction and salient properties

- Compact dimensions
- Nominal power range from 380W—4070W
- Energy levels from 25kJ-550kJ per case housing (5s duty, 120s cycle), depending on ohmic value
- Aluminium case housing for high IP rating
- IP50-IP65
- Internal ceramic supported wirewound spirals for lower ohmic values
- Internal mica supported wirewound elements for higher ohmic values
- Nickel-Chrome 8020 alloy for low thermal drift
- Mica insulated for high dielectric strength
- Al₂O₃ or SiO₂ filled for high thermal capacity/high power overload capability
- Low surface temperature
- Low noise level
- High vibration withstand capability
- Thermal relief expansion mounting feet
- Optional thermal switch or PT100 element for thermal protection
- Cable 300mm (AWG 14—AWG4) with cable sleeves or box connection up to 50mm²
- Multiple case housings (from 2-4 housings)
- Customized to your needs and application (OEM versions available)
- For UL approval, consult Danotherm

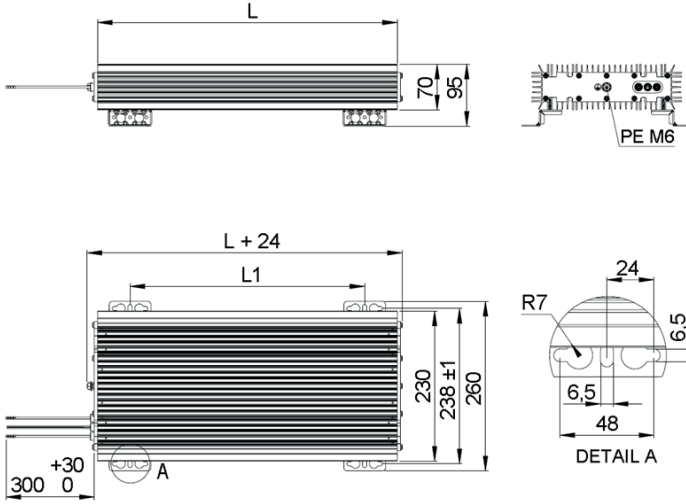


Temperature Coefficient:		100 ppm/K
Dielectric strength		3500 VAC @ 1 minute
Isolation Resistance:		> 20MΩ / case housing
Overload: @ 1 sec pulse / hour		10 - 100 x (depending on resistor)
Overload: @ 5 sec pulse / hour		4 - 25 x (depending on resistor)
Environmental:		- 40 °C / +70 °C
De-rating cable version		Linear: 40°C = Pn to 70°C = 0.85 * Pn
De-rating TW 200°C version		Linear: 40°C = Pn to 70°C = 0.65 * Pn
De-rating vertical mounting		no de-rating
De-rating horizontal mounting		0.8 * Pn
De-rating at high altitudes	1000 m	no de-rating
	1500 m	0.94 * Pn
	3000 m	0.82 * Pn
Mounting instructions		It is recommended to keep a distance of 200mm to the nearest object to prevent heating of a neighboring component.
		If two or more brake resistors are mounted next to each other the distance between these should be 400mm. If this is less then the nominal power needs to be de-rated.
Cooling		The nominal power of the resistors refers to cooling conditions with Free Natural Air Cooling.
Vibration		Acc. To EN 60068-2-6 frequency range 1 - 100Hz Acceleration / Amplitude
	1 - 13 Hz	± 1mm
	13 - 100 Hz	@ ± 0.7G
Corrosive resistance		Acc. IEC 60721-3-3/3K3 (C2 medium) 200 hours cyclic salt mist IEC 60068-2-52
Connection recommendations		To minimize EMC interference screened cables are recommended. in particular with any PWM brake pattern.
Resistance tolerance		± 10% (optional 5%)
Working voltage	Standard	UL: 600VAC / 850VDC ; IEC: 690VAC / 975VDC
	On request	1000VAC / 1400VDC
Time constant for heating up resistor		1000s
Thermal switch (optional)	Thermal switch	130 / 160 / 180 / 200 °C. 2A. 250 VAC NC
Minimum voltage		2V
Minimum current		10mA
Rated current / voltage		2.5A @ 250VAC cos φ=1
Dielectric voltage		2000VAC (3500VAC between TS and R)
Temperature requirements on cables	IP 21	80°C
	IP 65	90°C



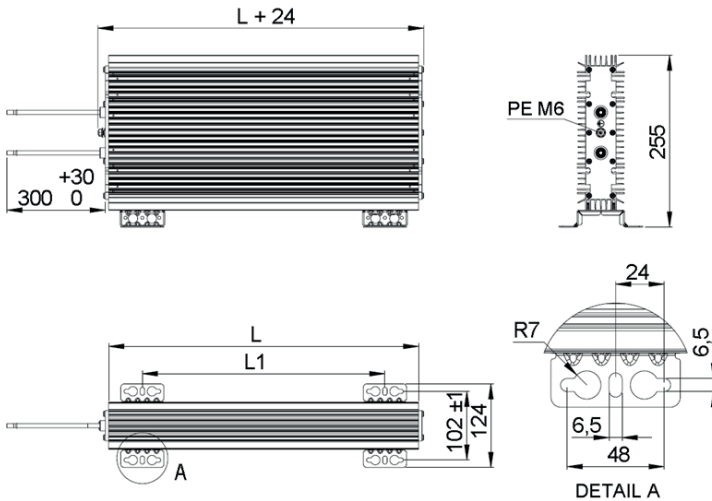
CBT-H ... CT ... cable connection IP50
with and without thermal switch

Mechanical drawings



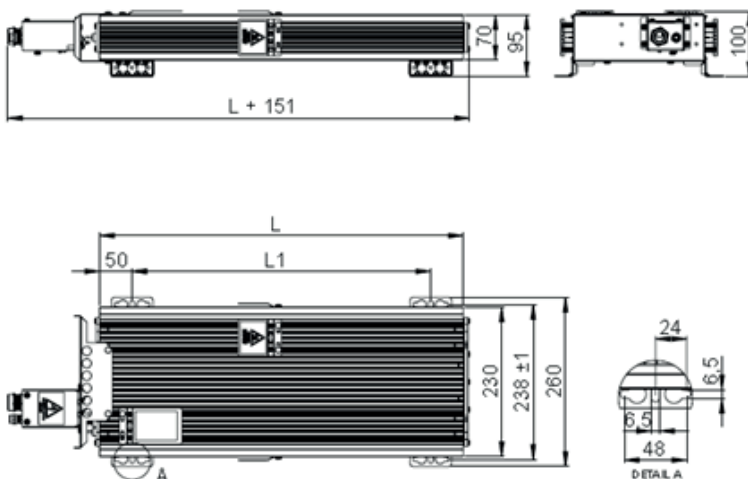
Type	L ± 2 mm	L1 ± 2 mm	Weight g
CBT-H 180 C(H/E)(T) 0X1	180	70	3.1
CBT-H 210 C(H/E)(T) 0X1	210	110	3.6
CBT-H 260 C(H/E)(T) 0X1	260	160	4.5
CBT-H 330 C(H/E)(T) 0X1	330	230	5.9
CBT-H 400 C(H/E)(T) 0X1	400	300	7.3
CBT-H 460 C(H/E)(T) 0X1	460	360	8.5
CBT-H 560 C(H/E)(T) 0X1	560	460	10
CBT-H 660 C(H/E)(T) 0X1	660	560	12
CBT-H 760 C(H/E)(T) 0X1	760	660	13.8
CBT-H 860 C(H/E)(T) 0X1	860	760	16
CBT-H 960 C(H/E)(T) 0X1	960	860	17.8

CBT-V ... CT ... cable connection IP50
with and without thermal switch



Type	L ± 2 mm	L1 ± 2 mm	Weight g
CBT-V 180 C(H/E)(T) 0X1	180	70	3.1
CBT-V 210 C(H/E)(T) 0X1	210	110	3.6
CBT-V 260 C(H/E)(T) 0X1	260	160	4.5
CBT-V 330 C(H/E)(T) 0X1	330	230	5.9
CBT-V 400 C(H/E)(T) 0X1	400	300	7.3
CBT-V 460 C(H/E)(T) 0X1	460	360	8.5
CBT-V 560 C(H/E)(T) 0X1	560	460	10
CBT-V 660 C(H/E)(T) 0X1	660	560	12
CBT-V 760 C(H/E)(T) 0X1	760	660	13.8
CBT-V 860 C(H/E)(T) 0X1	860	760	16
CBT-V 960 C(H/E)(T) 0X1	960	860	17.8

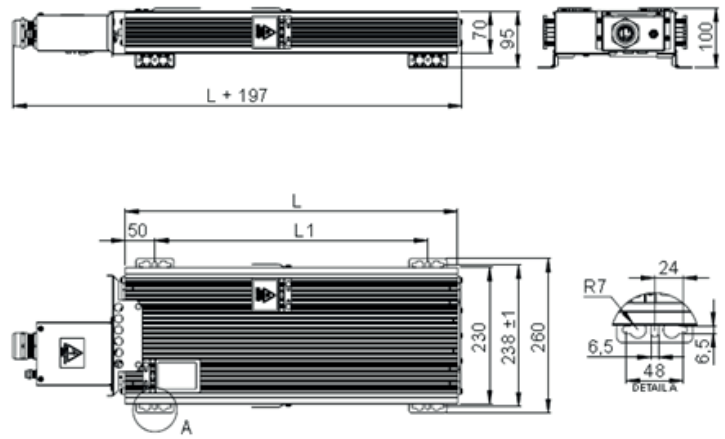
CBT-H ... D ... box connection IP54
with thermal switch



Type	L ± 2 mm	L1 ± 2 mm	Weight g
CBT-H 180 D(H/E)(T) 2X1	180	70	3.9
CBT-H 210 D(H/E)(T) 2X1	210	110	4.2
CBT-H 260 D(H/E)(T) 2X1	260	160	5.1
CBT-H 330 D(H/E)(T) 2X1	330	230	6.7
CBT-H 400 D(H/E)(T) 2X1	400	300	8.2
CBT-H 460 D(H/E)(T) 2X1	460	360	9.2
CBT-H 560 D(H/E)(T) 2X1	560	460	11
CBT-H 660 D(H/E)(T) 2X1	660	560	12.8
CBT-H 760 D(H/E)(T) 2X1	760	660	14.6
CBT-H 860 D(H/E)(T) 2X1	860	760	16.8
CBT-H 960 D(H/E)(T) 2X1	960	860	18.6

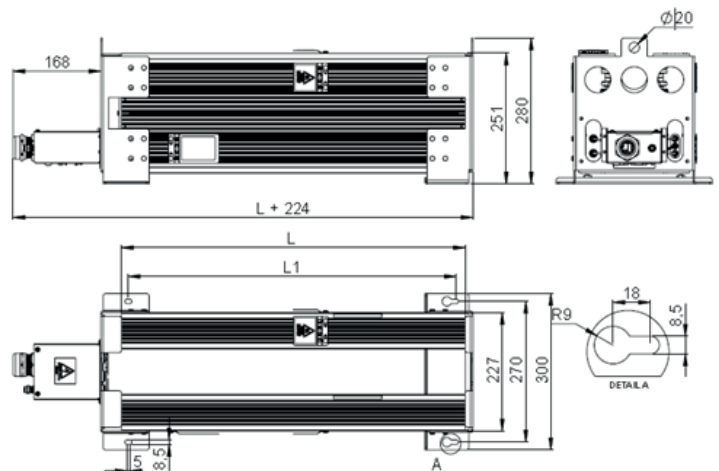
CBT-H ... G ... box connection IP20/IP21
with thermal switch

Type	L ± 2 mm	L1 ± 2 mm	Weight g
CBT-H 180 G(H/E)(T) 2X1	180	70	3.9
CBT-H 210 G(H/E)(T) 2X1	210	110	4.2
CBT-H 260 G(H/E)(T) 2X1	260	160	5.1
CBT-H 330 G(H/E)(T) 2X1	330	230	6.7
CBT-H 400 G(H/E)(T) 2X1	400	300	8.2
CBT-H 460 G(H/E)(T) 2X1	460	360	9.2
CBT-H 560 G(H/E)(T) 2X1	560	460	11
CBT-H 660 G(H/E)(T) 2X1	660	560	12.8
CBT-H 760 G(H/E)(T) 2X1	760	660	14.6
CBT-H 860 G(H/E)(T) 2X1	860	760	16.8
CBT-H 960 G(H/E)(T) 2X1	960	860	18.6



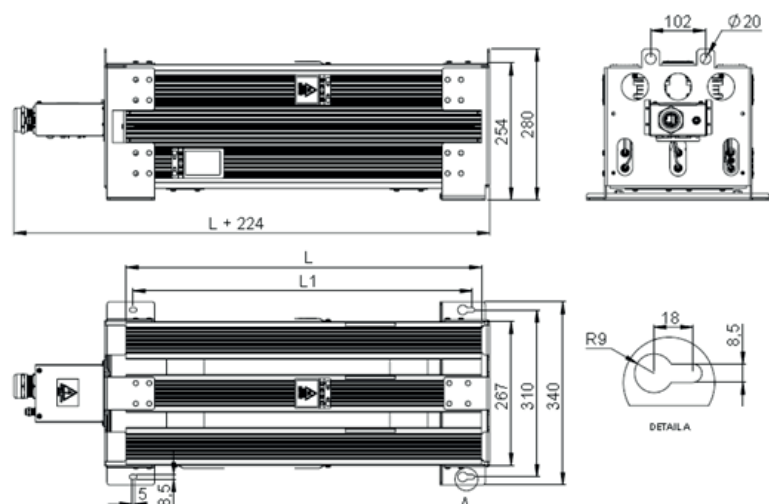
CBT-V ... G ... box connection IP20/IP21
with thermal switch

Type	L ± 2 mm	L1 ± 2 mm	Weight g
CBT-V 400 G(H/E)(T) 2X2	400	370	18
CBT-V 460 G(H/E)(T) 2X2	460	430	20.5
CBT-V 560 G(H/E)(T) 2X2	560	530	23.5
CBT-V 660 G(H/E)(T) 2X2	660	630	27
CBT-V 760 G(H/E)(T) 2X2	760	730	30.5
CBT-V 860 G(H/E)(T) 2X2	860	830	34.0
CBT-V 960 G(H/E)(T) 2X2	960	930	37.5



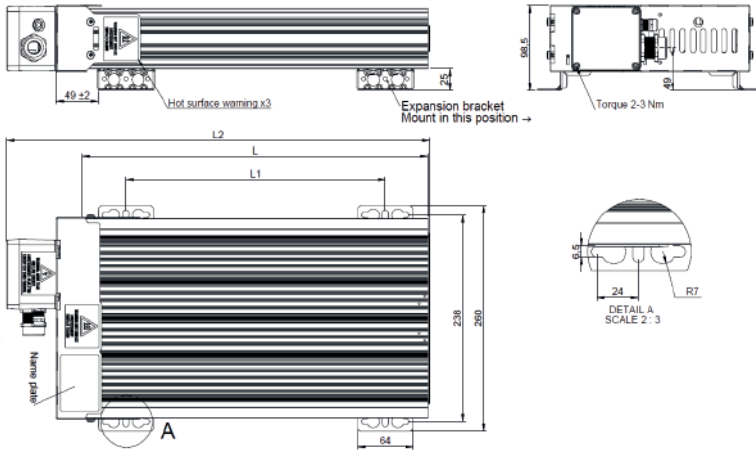
CBT-V ... G ... box connection IP20/IP21
with thermal switch

Type	L ± 2 mm	L1 ± 2 mm	Weight g
CBT-V 400 G(H/E)(T) 2X3	400	370	25.5
CBT-V 460 G(H/E)(T) 2X3	460	430	29
CBT-V 560 G(H/E)(T) 2X3	560	530	33.5
CBT-V 660 G(H/E)(T) 2X3	660	630	39
CBT-V 760 G(H/E)(T) 2X3	760	730	44.5
CBT-V 860 G(H/E)(T) 2X3	860	830	51
CBT-V 960 G(H/E)(T) 2X3	960	930	57



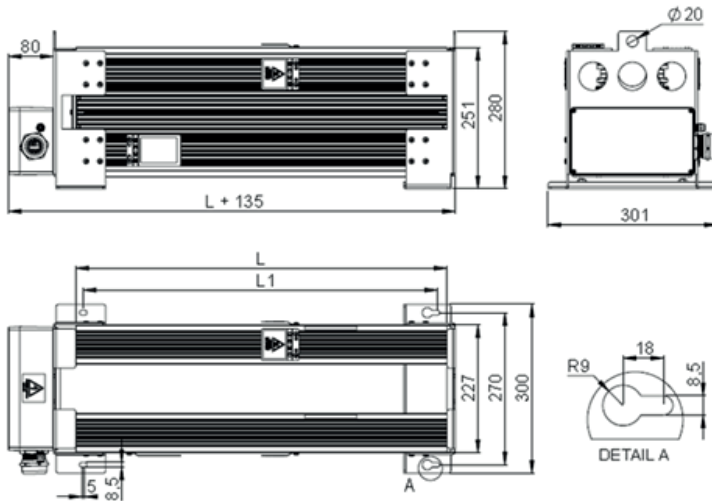
CBT-H ... B 2.1 cable connection IP65
with thermal switch

Mechanical drawings



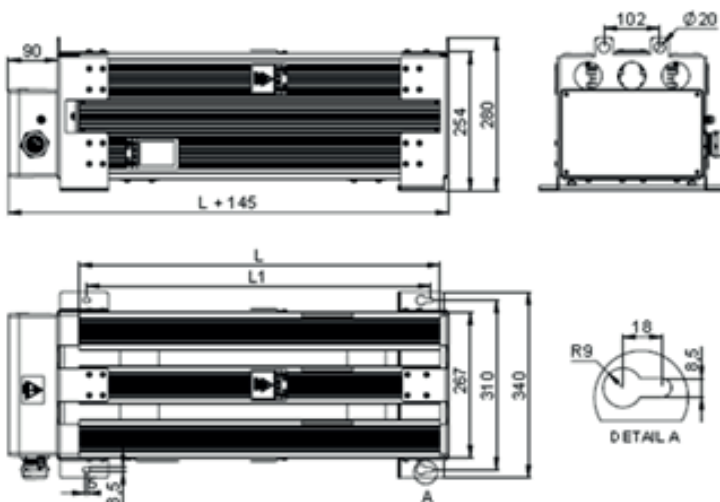
Type	L ± 2 mm	L1 ± 2 mm	Weight g
CBT-H 180 B(H)(T) 2X1	180	70	3.9
CBT-H 210 B(H)(T) 2X1	210	110	4.2
CBT-H 260 B(H)(T) 2X1	260	160	5.1
CBT-H 330 B(H)(T) 2X1	330	230	6.7
CBT-H 400 B(H)(T) 2X1	400	300	8.2
CBT-H 460 B(H)(T) 2X1	460	360	9.2
CBT-H 560 B(H)(T) 2X1	560	460	11.0
CBT-H 660 B(H)(T) 2X1	660	560	12.8
CBT-H 760 B(H)(T) 2X1	760	660	14.6
CBT-H 860 B(H)(T) 2X1	860	760	16.8
CBT-H 960 B(H)(T) 2X1	960	860	18.6

CBT-V ... B 2.2 cable connection IP65
with thermal switch



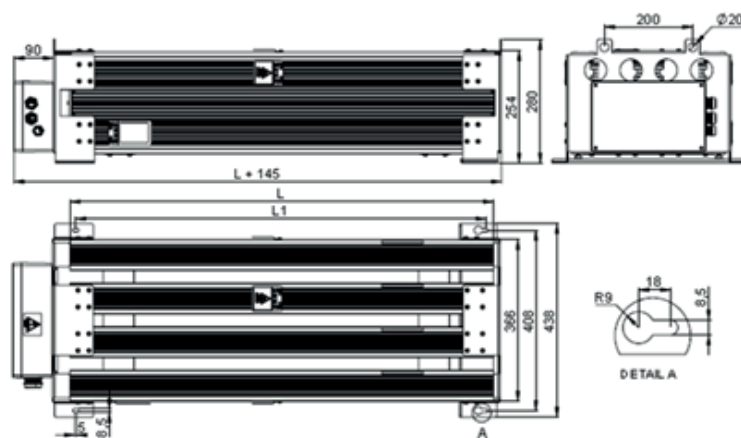
Type	L ± 2 mm	L1 ± 2 mm	Weight g
CBT-V 400 B(H)(T) 2X2	400	370	18.0
CBT-V 460 B(H)(T) 2X2	460	430	20.5
CBT-V 560 B(H)(T) 2X2	560	530	23.5
CBT-V 660 B(H)(T) 2X2	660	630	27.0
CBT-V 760 B(H)(T) 2X2	760	730	30.5
CBT-V 860 B(H)(T) 2X2	860	830	35.5
CBT-V 960 B(H)(T) 2X2	960	930	39.0

CBT-V ... B 2.3 box connection IP65
with thermal switch



Type	L ± 2 mm	L1 ± 2 mm	Weight g
CBT-V 400 B(H/E)(T) 2X3	400	370	25.5
CBT-V 460 B(H/E)(T) 2X3	460	430	29.0
CBT-V 560 B(H/E)(T) 2X3	560	530	33.5
CBT-V 660 B(H/E)(T) 2X3	660	630	39.0
CBT-V 760 B(H/E)(T) 2X3	760	730	44.5
CBT-V 860 B(H/E)(T) 2X3	860	830	51.0
CBT-V 960 B(H/E)(T) 2X3	960	930	57.0

Type	L ± 2 mm	L1 ± 2 mm	Weight g
CBT-V 400 B(H/E)(T) 2X4	400	370	25.5
CBT-V 460 B(H/E)(T) 2X4	460	430	29.0
CBT-V 560 B(H/E)(T) 2X4	560	530	33.5
CBT-V 660 B(H/E)(T) 2X4	660	630	39.0
CBT-V 760 B(H/E)(T) 2X4	760	730	44.5
CBT-V 860 B(H/E)(T) 2X4	860	830	51.0
CBT-V 960 B(H/E)(T) 2X4	960	930	57.0



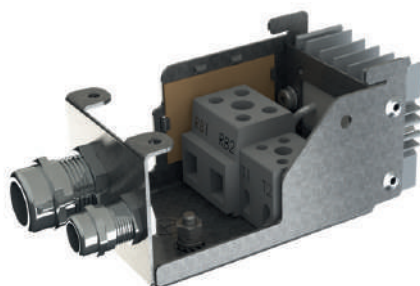
Connection box	IP rating	Cable gland	Clamping mm	Braid mm	Connection mm ²	TS gland	Clamping mm	Connection mm ²
B-box single	IP65	M25	9-16.6	7.5	1.5-50	M12	3-7	0.5-4
B-box multiple	IP65	M40	19-28	15	1.5-50	M12	3-7	0.5-4
D-box	IP21	M25	9-16.6	7.5	0.75-10	M12	3-7	0.5-4
G-box	IP21	M40	19-28	15	1.5-50	M12	3-7	0.5-4
K-type	IP00	-	-	-	0.75-10	-	-	-



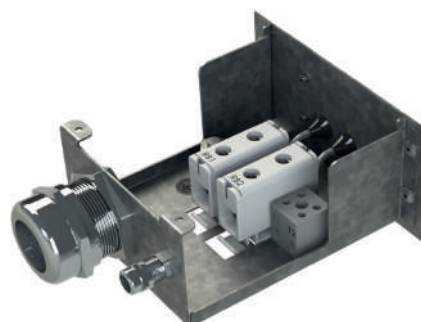
B-box





B-box multiple housings



D-box



G-box

Type	Square pulse each 120seconds, ambient temperature 40°C.									
	duty 1 second kW	Max temp °C	duty 5 seconds kW	Max temp °C	duty 10 seconds kW	Max temp °C	duty 20 seconds kW	Max temp °C	duty 40 seconds kW	Max temp °C
CBT-H 180 15R	18.4	110	5.1	140	3	160	1.9	180	1.1	220
CBT-H 210 100R	24.7	110	6.1	130	3.8	150	2.5	190	1.7	240
CBT-H 260 60R	44	130	10.7	150	6.4	180	4	210	2.7	270
CBT-H 330 40R	71	140	22	190	13	220	8	260	4.3	280
CBT-H 400 30R	105	160	30	210	18	250	10.7	290	5.4	280
CBT-H 460 20R	128	170	36	220	21	250	12	290	6.2	290
CBT-H 560 15R	190	200	50	250	28	280	15	300	7.6	300
CBT-H 660 14R	257	230	64	270	36	300	18	300	9.2	310
CBT-H 760 12R	315	240	78	290	43	310	21.5	310	10.7	310
CBT-H 860 10R	370	250	89	300	50	320	25	320	12.4	320
CBT-H 960 9R0	480	290	110	330	56	330	28	330	14	330
Type	Triangular pulse each 120seconds, ambient temperature 40°C.									
	duty 1 second kW	Max temp °C	duty 5 seconds kW	Max temp °C	duty 10 seconds kW	Max temp °C	duty 20 seconds kW	Max temp °C	duty 40 seconds kW	Max temp °C
CBT-H 180 15R	39	110	10.7	140	6.3	160	3.8	190	2.3	220
CBT-H 210 100R	50	110	12.7	130	7.7	150	4.9	180	3.2	230
CBT-H 260 60R	90	140	22	160	13	180	8	210	5	250
CBT-H 330 40R	148	140	46	200	27	230	16	260	8.5	280
CBT-H 400 30R	217	160	63	220	37	250	21	280	10.6	280
CBT-H 460 20R	265	170	74	230	44	260	25	290	12.3	290
CBT-H 560 15R	390	200	103	260	58	290	30	300	15	300
CBT-H 660 14R	530	230	134	280	73	310	37	310	18	310
CBT-H 760 12R	645	240	160	290	86	310	43	310	22	310
CBT-H 860 10R	578	260	183	300	98	320	50	320	25	320
CBT-H 960 9R0	983	290	226	330	113	330	57	330	28	330

The table above shows pulse power ratings for typical resistor sizes/lengths and typical Ohm values.

Pulse load

The ability to withstand pulse-loads varies according to resistor size, length and diameter of the internal resistor wire. As such, it is impossible to create standard graphs that would apply to all customer applications. In some cases, the load-profile will be the combination of a square and a triangular pulse, such as is the case with Low Voltage Ride Through (LVRT) and Emergency Brake situations, as encountered in the Wind Power industry.

On request, Danotherm performs simulations based on the actual application and for guidance, has produced tables for various load-profiles for resistors with standard wire. The above table shown is based on a resistor with indicated ohm value and standard wire thickness. Depending on the application, resistor construction can be adapted to optimally match the application. In the tables above, the peak powers of trains of rectangular and triangular pulses of 120 second periods are shown for durations of 1 to 40 seconds.