



# Coolers for industrial applications

## Designed for use in industrial systems for cooling and temperature control

### Thermoelectric coolers (TEC) for industrial application

provide high efficiency, reliability, and performance accuracy. Operation at temperature cycling conditions often requires rapid periodical changes of the temperatures of one or both sides of a TEC in a wide (several tens of degrees) range and a lifetime up to 500000 cycles. Thermoelectric modules and systems produced by KRYOTHERM meet all the modern industrial standards and special requirements. The quality and reliability of TECs are verified by numerous tests performed according to our advanced Quality Management System.

### Applications:

#### General Engineering:

- electronics and telecommunications equipment cooling and thermostabilization;
- thermoelectric cooling assemblies for electrical and electronics cabinets;
- high speed integrated circuits cooling;
- freezers for part fixing on a worktable;
- systems for temperature control over precision machining process equipment;
- equipment for active heat cycling for use in reliability testing of microprocessors and microchips;
- technological liquid coolers (exchangers) for semiconductor industry equipment;
- constant temperature baths for different technology processes;
- climatic chambers for radio electronic components testing;
- cooling systems for industrial and medical lasers and their's power supply units.

#### Medicine equipment:

- built-in refrigerators and conditioners for medical equipment;
- temperature controlled portable containers for storage and transportation of biological materials;
- temperature cycling systems for genetic engineering and PCR-diagnostics;
- heat exchangers for surgery;
- devices for recovery and preventive therapy;
- cold plates and isothermal bases for pharmacy and biology.

#### Measurement equipment:

- gas sampling dehumidifier;
- blackbody radiation standard;
- dew-point sensor;
- oil clouding-point tester;
- heat flow probes.

#### Transport:

- refrigerators and water coolers for cars, coaches, yachts, etc.;
- local systems for driver air conditioning and climatization in tractors and heavy trucks.

### Food industry:

- cooling devices for industrial production, storage and transportation of foods;
- water and beverage coolers for restaurants, bars and cafes.

**KRYOTHERM's TEC's can operate at high temperatures, pressures, humidity and in fine vacuum.**

### Environmental Safety Features:

According to RoHS directive requirements, thermoelectric coolers do not contain lead or any other forbidden materials.



**KRYOTHERM produces a wide range of thermoelectric single-stage coolers that can be used for industrial applications. TEC's that are introduced in this catalogue are able to solve most of the tasks of industrial cooling and thermo-stabilizing and are subdivided by design to high efficient, standard, one or two sections, round, square or rectangular shape ones, with or without a hole.**

Distributor



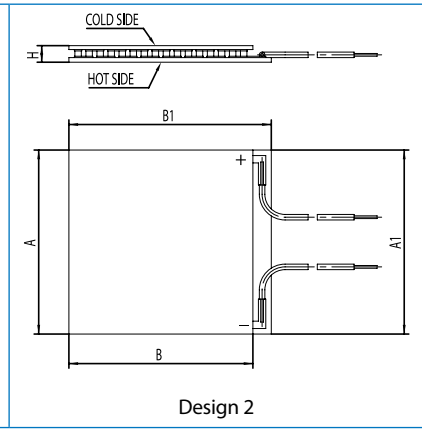
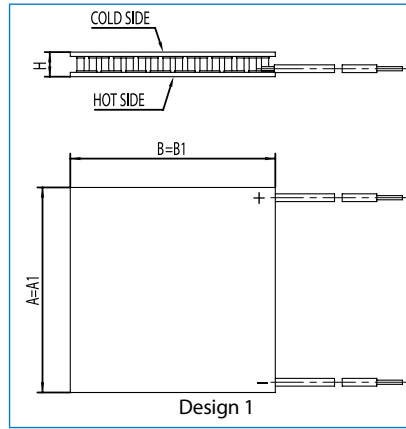
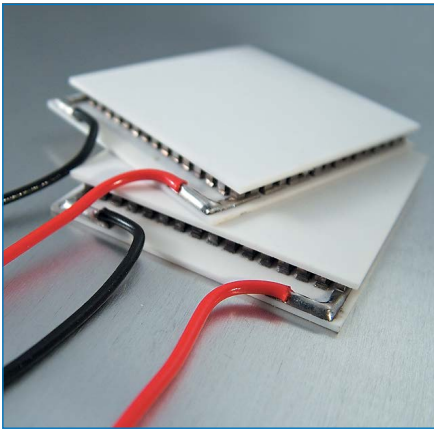
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# Coolers for industrial applications



## High efficient single-stage modules



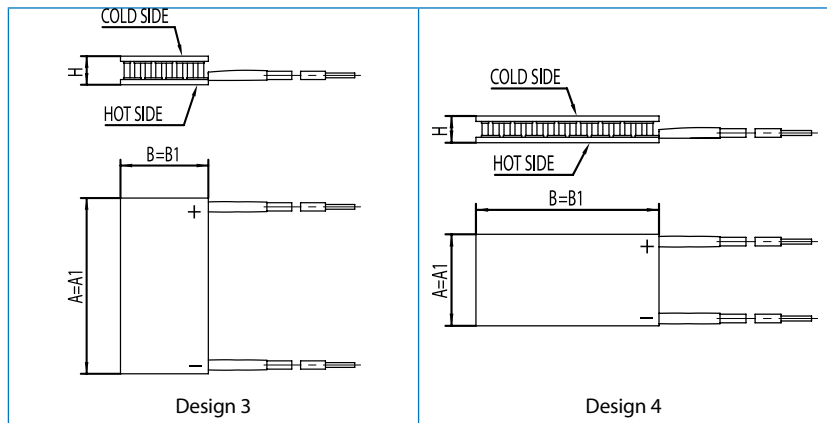
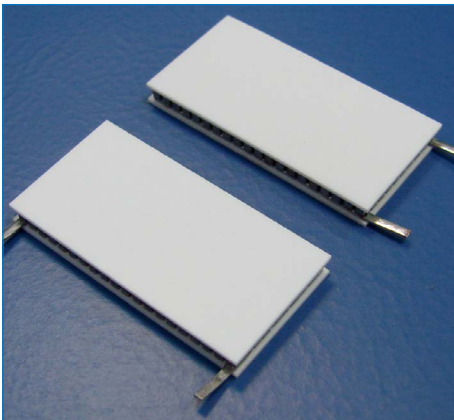
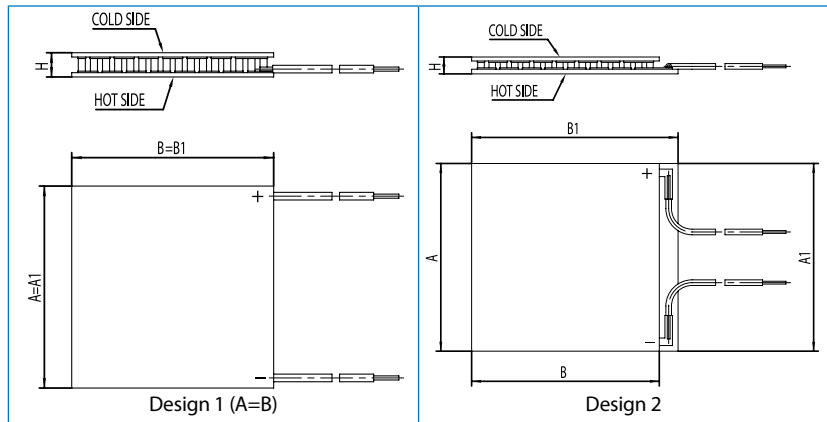
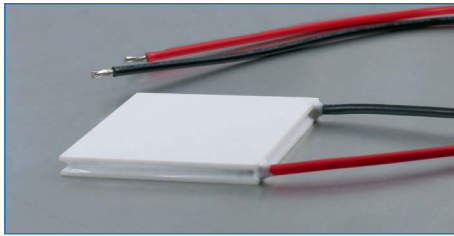
## High efficient single-stage TECs

Type	I <sub>max</sub> , A	Q <sub>max</sub> , W	U <sub>max</sub> , V	ΔT <sub>max</sub> , K	R <sub>ac</sub> , Ohm	Dimensions, mm					Design
						A	B	A1	B1	H	
SNOWBALL-71	3,6	36,0	16,1	71	3,2	30,0	30,0	30,0	30,0	3,6	1
						30,0	30,0	30,0	34,0		2
STORM-71	3,6	36,0	16,1	71	3,2	40,0	40,0	40,0	40,0	4,8	1
RIME-74	3,8	38,0	16,7	74	3,3	40,0	40,0	40,0	44,0		
FROST-72	6,2	62,0	16,3	72	2,05	40,0	40,0	40,0	40,0	3,9	1
						40,0	40,0	40,0	44,0		2
FROST-74	6,3	65,0	16,7	74	2,05	40,0	40,0	40,0	40,0	3,9	1
						40,0	40,0	40,0	44,0		2
FROST-75	6,3	66,0	16,8	75	2,05	40,0	40,0	40,0	40,0	3,9	1
						40,0	40,0	40,0	44,0		2
ICE-71	8,0	80,0	16,1	71	1,5	40,0	40,0	40,0	40,0	3,4	1
						40,0	40,0	40,0	44,0		2
HAIL-71	8,0	80,0	16,1	71	1,5	48,0	48,0	48,0	48,0	3,9	1
GLACIER- 1,5	6,1	76,0	20,1	72	2,6	40,0	40,0	40,0	44,0		
GLACIER- 2,0	4,6	57,0	20,1	72	3,3	40,0	40,0	40,0	40,0	4,3	1
						40,0	40,0	40,0	44,0		2
DRIFT-2,0	4,5	69,0	24,9	70	4,0	40,0	40,0	40,0	40,0	4,4	1
						35,0	55,0	35,0	55,0		
						40,0	58,0	40,0	58,0		
DRIFT-1,5	6,1	94,0	24,9	70	3,2	40,0	40,0	40,0	40,0	4,1	1
						35,0	55,0	35,0	55,0		
						40,0	58,0	40,0	58,0		
DRIFT-1,2	7,6	115,0	24,6	69	2,4	40,0	40,0	40,0	40,0	3,7	1
						35,0	55,0	35,0	55,0		
DRIFT-1,15	7,9	120,0	24,6	69	2,4	40,0	40,0	40,0	40,0	3,6	1
						35,0	55,0	35,0	55,0		
DRIFT-1,05	8,6	131,0	24,6	69	2,15	40,0	40,0	40,0	40,0	3,5	1
						35,0	55,0	35,0	55,0		
						40,0	58,0	40,0	58,0		
DRIFT-0,8	11,3	172,0	24,6	69	1,65	40,0	40,0	40,0	40,0	3,2	1
						35,0	55,0	35,0	55,0		
						40,0	58,0	40,0	58,0		
DRIFT-0,6	15,1	229,0	24,6	68	1,25	40,0	40,0	40,0	40,0	3,1	1
						35,0	55,0	35,0	55,0		
CHILL	5,8	56,0	15,7	69	2,0	40,0	40,0	40,0	40,0	3,2	1
						40,0	40,0	40,0	40,0		



# Coolers for industrial applications

## Standard single-stage modules



## Standard single-stage TECs

Type	I <sub>max</sub> , (Amps)	Q <sub>max</sub> , (Watts)	U <sub>max</sub> , (Volts)	ΔT <sub>max</sub> , (K)	R <sub>ac</sub> , (Ohm)	Dimensions, mm					Design
						A	B	A1	B1	H	
TB-127-0,8-1,5	2,0	19,1	15,7	69	5,85	25,0	25,0	25,0	25,0	3,8	1
TB-7-1,0-2,5	1,9	1,0	0,9	70	0,33	8,0	8,0	8,0	8,0	4,8	
TB-17-1,0-2,5	1,9	2,5	2,1	70	0,85	11,5	11,5	11,5	11,5	4,8	
TB-31-1,0-2,5	1,9	4,5	3,9	70	1,50	14,8	14,8	14,8	14,8	4,8	
TB-63-1,0-2,5	1,9	9,1	7,9	70	3,00	15,0	30,0	15,0	30,0	4,8	4
						30,0	15,0	30,0	15,0	4,8	3
TB-71-1,0-2,5	1,9	10,2	8,9	70	3,35	23,0	23,0	23,0	23,0	4,8	1
TB-83-1,0-2,5	1,9	12,0	10,4	70	4,15	22,0	19,0	22,0	19,0	4,8	3
TB-127-1,0-2,5	1,9	18,3	15,9	70	6,20	30,0	30,0	30,0	30,0	4,8	1
						30,0	30,0	30,0	34,0	4,8	2
TB-287-1,0-2,5	1,9	40,7	35,7	69	14,00	40,0	40,0	40,0	40,0	4,8	1
TB-7-1,0-2,0	2,3	1,3	0,9	70	0,26	8,0	8,0	8,0	8,0	4,3	
TB-17-1,0-2,0	2,3	3,1	2,1	70	0,65	11,5	11,5	11,5	11,5	4,3	
TB-31-1,0-2,0	2,3	5,6	3,9	70	1,25	14,8	14,8	14,8	14,8	4,3	
						15,0	15,0	15,0	15,0	4,3	

# Coolers for industrial applications



Type	I <sub>max</sub> , (Amps)	Q <sub>max</sub> , (Watts)	U <sub>max</sub> , (Volts)	ΔT <sub>max</sub> , (K)	R <sub>ac</sub> , (Ohm)	Dimensions, mm					Design
						A	B	A1	B1	H	
TB-63-1,0-2,0	2,3	11,4	7,9	70	2,50	15,0	30,0	15,0	30,0	4,3	4
						30,0	15,0	30,0	15,0		3
TB-71-1,0-2,0	2,3	12,8	8,9	70	2,70	23,0	23,0	23,0	23,0	4,3	1
TB-83-1,0-2,0	2,3	14,9	10,4	70	3,20	22,0	19,0	22,0	19,0	4,3	3
TB-127-1,0-2,0	2,3	22,9	15,9	70	4,85	30,0	30,0	30,0	30,0	4,3	1
						30,0	30,0	30,0	34,0		2
TB-127-1,0-1,8	2,6	24,9	15,7	69	4,35	30,0	30,0	30,0	30,0	4,1	1
						30,0	30,0	30,0	34,0		2
TB-7-1,0-1,5	3,1	1,7	0,9	69	0,20	8,0	8,0	8,0	8,0	3,8	1
TB-17-1,0-1,5	3,1	4,0	2,1	69	0,50	11,5	11,5	11,5	11,5	3,8	
TB-31-1,0-1,5	3,1	7,3	3,8	69	0,90	14,8	14,8	14,8	14,8	3,8	
						15,0	15,0	15,0	15,0		
TB-63-1,0-1,5	3,1	14,8	7,8	69	1,80	15,0	30,0	15,0	30,0	3,8	4
						30,0	15,0	30,0	15,0		3
TB-71-1,0-1,5	3,1	16,7	8,8	69	2,05	23,0	23,0	23,0	23,0	3,8	1
TB-83-1,0-1,5	3,1	19,5	10,3	69	2,40	22,0	19,0	22,0	19,0	3,8	3
TB-127-1,0-1,5	3,1	29,9	15,7	69	3,65	30,0	30,0	30,0	30,0	3,8	1
						30,0	30,0	30,0	34,0		2
TB-287-1,0-1,5	3,1	67,8	35,7	69	8,50	40,0	40,0	40,0	40,0	3,8	1
TB-7-1,0-1,3	3,6	1,9	0,9	69	0,18	8,0	8,0	8,0	8,0	3,6	
TB-17-1,0-1,3	3,6	4,6	2,1	69	0,42	11,5	11,5	11,5	11,5	3,6	
TB-23-1,0-1,3	3,6	6,2	2,85	69	0,6	30,0	5,0	30,0	5,0	3,1	4
TB-31-1,0-1,3	3,6	8,4	3,8	69	0,80	14,8	14,8	14,8	14,8	3,6	1
						15,0	15,0	15,0	15,0		
TB-63-1,0-1,3	3,6	17,1	7,8	69	1,60	15,0	30,0	15,0	30,0	3,6	4
						30,0	15,0	30,0	15,0		3
TB-71-1,0-1,3	3,6	19,3	8,8	69	1,80	23,0	23,0	23,0	23,0	3,6	1
TB-83-1,0-1,3	3,6	22,5	10,3	69	2,20	22,0	19,0	22,0	19,0	3,6	3
TB-127-1,0-1,3	3,6	34,5	15,7	69	3,20	30,0	30,0	30,0	30,0	3,6	1
						30,0	30,0	30,0	34,0		2
TB-287-1,0-1,3	3,6	78,2	35,7	69	7,40	40,0	40,0	40,0	40,0	3,6	1
TB-63-1,0-1,15	4,0	19,3	7,8	69	1,42	15,0	30,0	15,0	30,0	3,4	4
						30,0	15,0	30,0	15,0		3
TB-32-1,0-0,8	5,8	14,1	3,9	68	0,53	40,0	6,0	40,0	6,0	3,1	3
TB-45-1,0-0,8	5,9	20,0	5,6	68	0,73	36,0	6,0	36,0	6,0	3,1	4
TB-127-1,0-0,8	5,8	56,0	15,7	69	2,05	30,0	30,0	30,0	30,0	3,1	1
						30,0	30,0	30,0	34,0		2
TB-159-1,0-0,8	5,8	69	19,6	69	3,37	32,7	41,7	32,7	41,7	3,2	4
TB-195-1,0-0,8	5,8	86,0	24,1	68	3,20	50,0	25,0	50,0	25,0	3,1	3
TB-119-1,0-0,6	7,7	70,0	14,8	68	1,48	24,0	24,5	24,0	26,5	2,15	2
TB-71-1,4-3,175	2,9	16,5	9,1	72	2,35	30,0	30,0	30,0	30,0	5,6	1
TB-127-1,4-2,9	3,2	32,3	16,3	72	3,70	40,0	40,0	40,0	40,0	5,2	1
						40,0	40,0	40,0	44,0		2
TB-7-1,4-2,5	3,7	2,1	0,9	72	0,18	10,0	10,0	10,0	10,0	4,9	1
TB-17-1,4-2,5	3,7	5,0	2,2	72	0,45	15,0	15,0	15,0	15,0	4,9	

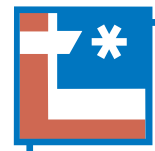
To be continued on the page 12.



# Coolers for industrial applications

Type	I <sub>max</sub> , (Amps)	Q <sub>max</sub> , (Watts)	U <sub>max</sub> , (Volts)	ΔT <sub>max</sub> , (K)	R <sub>ac</sub> , (Ohm)	Dimensions, mm					Design
						A	B	A1	B1	H	
TB-31-1,4-2,5	3,7	9,1	4,0	72	0,80	20,0	20,0	20,0	20,0	4,9	1
TB-48-1,4-2,5	3,6	13,5	6,0	70	1,25	35,0	20,0	35,0	20,0	4,9	3
TB-63-1,4-2,5	3,7	18,6	8,1	72	1,60	20,0	40,0	20,0	40,0	4,9	4
						40,0	20,0	40,0	20,0		3
TB-71-1,4-2,5	3,7	20,9	9,1	72	1,80	30,0	30,0	30,0	30,0	4,9	1
TB-99-1,4-2,5	3,6	27,9	12,4	70	2,45	20,0	40,0	20,0	40,0	4,9	4
						40,0	20,0	40,0	20,0		3
TB-123-1,4-2,5	3,6	34,6	15,4	70	3,20	40,0	40,0	40,0	40,0	4,9	1
TB-127-1,4-2,5	3,7	37,4	16,3	72	3,20	40,0	40,0	40,0	40,0	4,8	1
						40,0	40,0	40,0	44,0		2
TB-63-1,4-2,0	4,6	22,2	7,9	70	1,25	20,0	40,0	20,0	40,0	4,4	4
						40,0	20,0	40,0	20,0		3
TB-127-1,4-2,0	4,6	45,0	15,9	70	2,50	40,0	40,0	40,0	40,0	4,3	1
						40,0	40,0	40,0	44,0		2
TB-161-1,4-2,0	4,6	57,0	20,1	70	3,30	40,0	40,0	40,0	40,0	4,3	1
						40,0	40,0	40,0	44,0		2
TB-71-1,4-1,8	5,1	27,9	8,9	70	1,28	30,0	30,0	30,0	30,0	4,2	1
TB-7-1,4-1,5	6,1	3,3	0,9	69	0,11	10,0	10,0	10,0	10,0	4,0	
TB-17-1,4-1,5	6,1	8,0	2,1	70	0,28	15,0	15,0	15,0	15,0	4,0	
TB-31-1,4-1,5	6,1	14,6	3,9	70	0,50	20,0	20,0	20,0	20,0	4,0	
TB-35-1,4-1,5	6,1	16,4	4,4	70	0,58	15,0	30,0	15,0	30,0	4,0	4
						30,0	15,0	30,0	15,0		3
TB-63-1,4-1,5	6,1	29,7	7,9	70	1,05	20,0	40,0	20,0	40,0	4,0	4
						40,0	20,0	40,0	20,0		3
TB-71-1,4-1,5	6,1	33,4	8,9	70	1,17	30,0	30,0	30,0	30,0	4,0	1
TB-99-1,4-1,5	6,1	46,0	12,4	70	1,70	20,0	40,0	20,0	40,0	4,0	4
						40,0	20,0	40,0	20,0		3
TB-123-1,4-1,5	6,1	58,0	15,4	70	2,00	40,0	40,0	40,0	40,0	4,0	1
TB-127-1,4-1,5	6,1	60,0	15,9	70	2,05	40,0	40,0	40,0	40,0	3,9	1
						40,0	40,0	40,0	44,0		2
TB-161-1,4-1,5	6,1	76,0	20,1	70	2,60	40,0	40,0	40,0	40,0	3,9	1
						40,0	40,0	40,0	44,0		2
TB-241-1,4-1,5	6,1	113,0	30,0	70	3,85	55,0	55,0	55,0	59,0	4,0	2
TB-127-1,4-1,2	7,6	75,0	15,9	70	1,50	40,0	40,0	40,0	40,0	3,5	1
						40,0	40,0	40,0	44,0		2
TB-7-1,4-1,15	7,9	4,2	0,9	69	0,085	10,0	10,0	10,0	10,0	3,6	1
TB-17-1,4-1,15	7,9	10,2	2,1	69	0,20	15,0	15,0	15,0	15,0	3,6	
TB-31-1,4-1,15	7,9	18,6	3,8	69	0,36	20,0	20,0	20,0	20,0	3,6	
TB-35-1,4-1,15	7,9	21,0	4,3	69	0,40	15,0	30,0	15,0	30,0	3,6	4
						30,0	15,0	30,0	15,0		3
TB-63-1,4-1,15	7,9	37,9	7,8	69	0,75	20,0	40,0	20,0	40,0	3,6	4
						40,0	20,0	40,0	20,0		3
TB-71-1,4-1,15	7,9	43,0	8,8	69	0,80	30,0	30,0	30,0	30,0	3,6	1
TB-127-1,4-1,15	7,9	76,0	15,7	69	1,50	40,0	40,0	40,0	40,0	3,4	1
						40,0	40,0	40,0	44,0		2

# Coolers for industrial applications

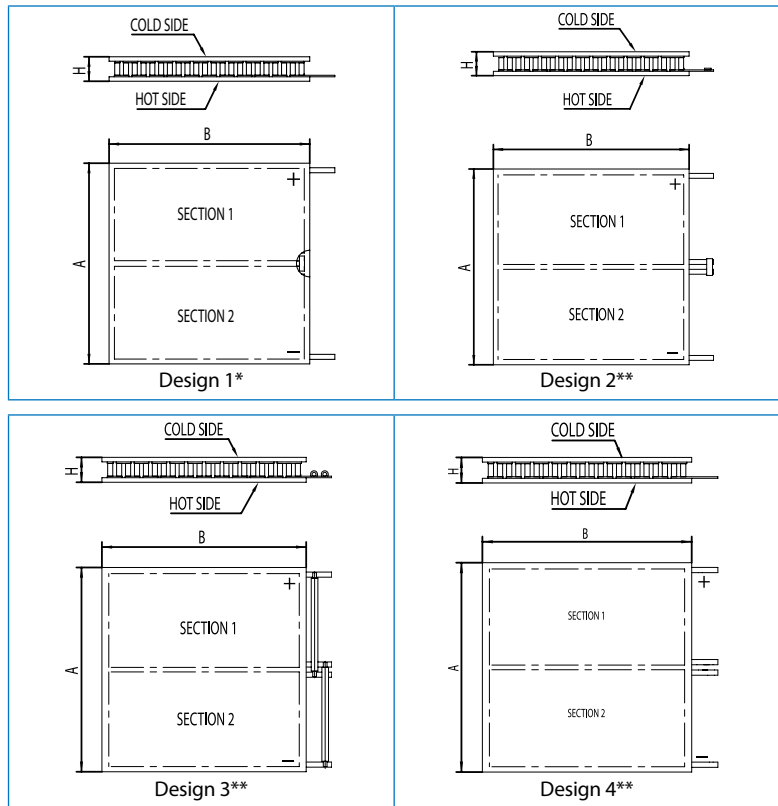
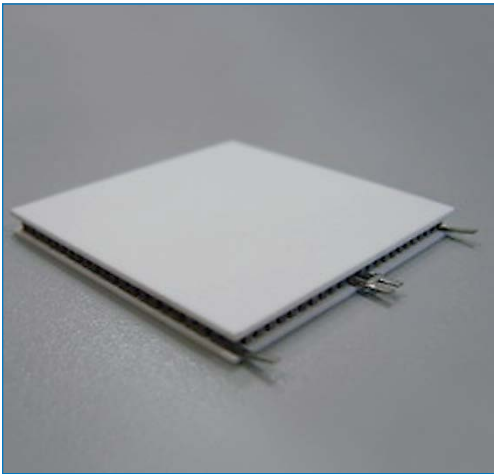


Type	I <sub>max</sub> , (Amps)	Q <sub>max</sub> , (Watts)	U <sub>max</sub> , (Volts)	ΔT <sub>max</sub> , (K)	R <sub>ac</sub> , (Ohm)	Dimensions, mm					Design
						A	B	A1	B1	H	
TB-35-1,4-1,05	8,6	23,0	4,3	69	0,38	15,0	30,0	15,0	30,0	3,4	4
						30,0	15,0	30,0	15,0		3
TB-99-1,4-1,05	8,6	65,0	12,3	69	1,07	20,0	40,0	20,0	40,0	3,4	4
						40,0	20,0	40,0	20,0		3
TB-127-1,4-1,05	8,6	84,0	15,7	69	1,40	40,0	40,0	40,0	40,0	3,3	1
						40,0	40,0	40,0	44,0		2
TB-49-1,4-0,8	11,3	42,0	6,1	69	0,40	20,0	20,0	20,0	20,0	3,2	1
TB-99-1,4-0,8	11,3	86,0	12,3	69	0,80	20,0	40,0	20,0	40,0	3,2	4
						40,0	20,0	40,0	20,0		3
TB-7-2,0-2,5	7,6	4,2	0,9	72	0,092	14,8	14,8	14,8	14,8	4,8	1
TB-17-2,0-2,5	7,6	10,2	2,2	72	0,20	22,0	22,0	22,0	22,0	4,8	
TB-31-2,0-2,5	7,6	18,7	4,0	72	0,40	30,0	30,0	30,0	30,0	4,8	
TB-71-2,0-2,5	7,6	43,0	9,1	72	0,87	40,0	40,0	40,0	40,0	4,8	
TB-127-2,0-2,5	7,6	76,0	16,3	72	1,65	48,0	48,0	48,0	48,0	4,8	1
						55,0	55,0	55,0	55,0		
						62,0	62,0	62,0	62,0		
TB-127-2,0-1,65	11,3	111,0	15,9	70	1,00	48,0	48,0	48,0	48,0	4,0	
						55,0	55,0	55,0	55,0		
						62,0	62,0	62,0	62,0		
TB-7-2,0-1,5	12,4	6,7	0,9	70	0,055	14,8	14,8	14,8	14,8	3,8	1
TB-17-2,0-1,5	12,4	16,3	2,1	70	0,12	22,0	22,0	22,0	22,0	3,8	
TB-31-2,0-1,5	12,4	29,8	3,9	70	0,24	30,0	30,0	30,0	30,0	3,8	
TB-71-2,0-1,5	12,4	68,0	8,9	70	0,52	40,0	40,0	40,0	40,0	3,8	
TB-127-2,0-1,5	12,4	122,0	15,9	70	0,95	48,0	48,0	48,0	48,0	3,8	1
						55,0	55,0	55,0	55,0		
						62,0	62,0	62,0	62,0		
TB-111-2,0-0,8	23,1	196,0	13,7	68	0,59	35,0	40,0	35,0	40,0	3,1	
TB-71-2,0-1,15	16,1	87,0	8,8	69	0,40	40,0	40,0	40,0	40,0	3,4	1
TB-127-2,0-1,15	16,1	156,0	15,7	69	0,75	48,0	48,0	48,0	48,0	3,4	
						55,0	55,0	55,0	55,0		
						62,0	62,0	62,0	62,0		
TB-127-2,0-1,05	17,6	171,0	15,7	69	0,66	48,0	48,0	48,0	48,0	3,4	
						55,0	55,0	55,0	55,0		
						62,0	62,0	62,0	62,0		
TB-199-2,0-0,9	20,6	310,0	24,6	69	0,87	62,0	62,0	62,0	62,0	3,2	2
TB-199-2,0-0,8	23,1	352,0	24,7	69	0,80	55,0	55,0	55,0	55,0	3,7	
TB-127-2,2-1,15	19,5	189,0	15,7	69	0,58	55,0	55,0	55,0	59,0	3,5	2
TB-127-2,2-0,95	23,4	223,0	15,5	68	0,51	55,0	55,0	55,0	59,0	3,3	2
TB-31-2,8-1,5	24,4	58,0	3,9	70	0,12	40,0	40,0	40,0	40,0	4,1	1
TB-32-2,8-1,5	24,4	60,0	4,0	70	0,125	40,0	40,0	40,0	40,0	4,0	
TB-31-5,0-1,8	64,0	149,0	3,8	68	0,047	55,0	55,0	55,0	55,0	5,3	
TB-31-5,0-1,5	77,0	178,0	3,8	68	0,039	55,0	55,0	55,0	55,0	5,0	



# Coolers for industrial applications

## Two sections single-stage TECs



- \* — design with two lead tabs and internal serial connection of the sections;
- \*\* — design with four lead tabs and sections connected in serial (design 2), in parallel (design 3) and without connection between the sections (design 4).

## Two sections single-stage TECs

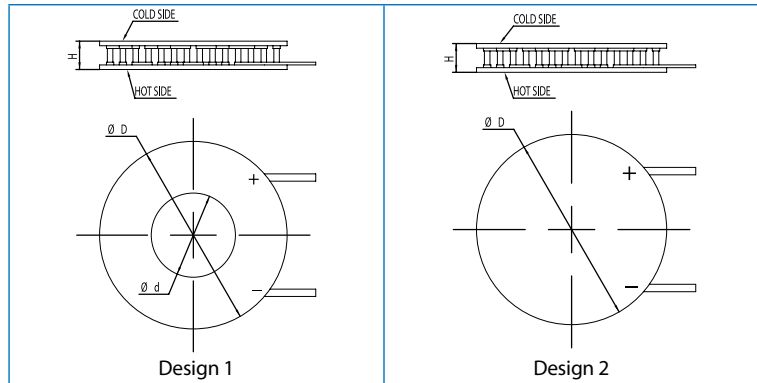
Type	Sections connection type	Design	I <sub>max</sub> , (Amps)	Q <sub>max</sub> , (Watts)	U <sub>max</sub> , (Volts)	ΔT <sub>max</sub> , (K)	R <sub>ac</sub> *, (Ohm)	Dimensions (mm)		
								A	B	H
TURBO-2,5	Serial	1	1,85	36,6	31,8	70	12,2	40,0	40,0	4,8
		2								
	Parallel	3	3,7	60,0	15,9	3,1	40,0	40,0	4,8	
	Separate	4								6,2+ +6,2
TURBO-1,5	Serial	1	3,1	60,0	31,4	69	7,5	40,0	40,0	3,8
		2								
	Parallel	3	6,2	69,0	15,7	1,85	40,0	40,0	3,8	
	Separate	4								3,65+ +3,65
TURBO-1,3	Serial	1	3,6	69,0	31,4	69	6,5	40,0	40,0	3,6
		2								
	Parallel	3	7,2	69,0	15,7	1,6	40,0	40,0	3,6	
	Separate	4								3,2+ +3,2

\* — For design 4 the resistance of each separate section is indicated.





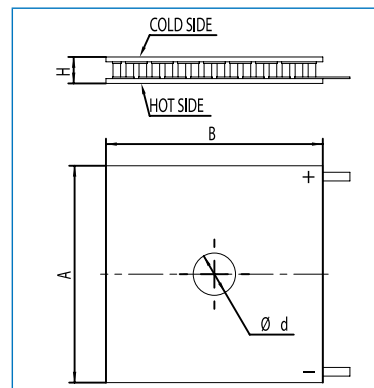
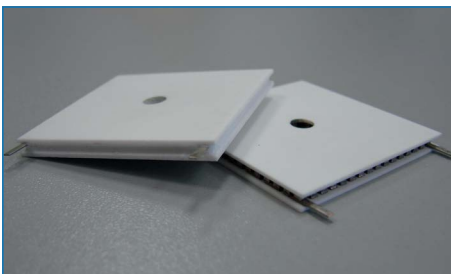
## Standard single-stage round shape modules



### Round shape single-stage TECs

Type	I <sub>max</sub> , (Amps)	Q <sub>max</sub> , (Watts)	U <sub>max</sub> , (Volts)	ΔT <sub>max</sub> , (K)	R <sub>ac</sub> , (Ohm)	Dimensions, mm			Design
						D	d	H	
TB-21-1,0-1,3CHR	3,6	5,7	2,6	69	0,52	15,0	3,0	3,6	1
TB-38-1,0-0,8CHR	5,8	16,8	4,7	69	0,64	24,0	9,8	3,1	
TB-38-1,0-1,3CHR	3,6	10,3	4,7	69	1,00	24,0	9,8	3,6	
TB-38-1,0-1,5CHR	3,1	8,9	4,7	69	1,12	24,0	9,8	3,8	
TB-43-1,0-0,8CHR	5,8	19,0	5,3	69	0,70	24,0	5,0	3,1	
TB-253-1,4-1,5 R	6,1	119,0	31,7	70	4,30	62,0	-	3,9	2

## Rectangular single-stage modules with hole



### Rectangular shape single-stage TECs with a hole

Type	I <sub>max</sub> , (Amps)	Q <sub>max</sub> , (Watts)	U <sub>max</sub> , (Volts)	ΔT <sub>max</sub> , (K)	R <sub>ac</sub> , (Ohm)	Dimensions, mm			
						A	B	H	d
TB-41-1,0-0,8CH	5,8	18,1	5,1	68	0,67	22,5	17,5	3,1	9,5
TB-41-1,0-1,3CH	3,6	11,2	5,1	69	1,10	22,5	17,5	3,6	9,5
TB-41-1,0-1,5CH	3,1	9,6	5,1	69	1,20	20,0	20,0	3,8	6,5
TB-119-1,0-1,3CH	3,6	32,3	14,7	69	3,10	30,0	30,0	3,6	4,0
TB-119-1,0-1,5CH	3,1	28,0	14,7	69	3,40	30,0	30,0	3,8	4,0
TB-119-1,0-2,0CH	2,3	21,0	14,7	69	4,90	30,0	30,0	4,3	4,0
TB-41-1,4-1,1CH	8,3	25,9	5,1	69	0,45	23,0	23,0	3,5	9,5
TB-109-1,4-1,5CH	6,1	51,0	13,7	70	1,80	40,0	40,0	4,0	13,0
TB-119-1,4-1,15CH	7,9	72,0	14,7	69	1,40	40,0	40,0	3,6	7,8
TB-119-1,4-1,5CH	6,1	56,0	14,9	70	1,90	40,0	40,0	4,0	7,8
TB-119-1,4-2,5CH	3,7	35,1	15,3	72	3,00	40,0	40,0	4,9	7,8
TB-125-1,4-1,15CH	7,9	75,0	15,5	69	1,50	40,0	40,0	3,6	4,7
TB-125-1,4-1,5CH	6,1	59,0	15,7	70	2,00	40,0	40,0	4,0	4,7
TB-125-1,4-2,5CH	3,7	36,8	16,0	72	3,10	40,0	40,0	4,9	4,7





# Coolers for industrial applications

Additional options		
Description	Notation (*)	Note
<b>Substrates material</b>		
Alumina Al <sub>2</sub> O <sub>3</sub> (BK-96)	-	Standard performance
Aluminium nitride (AlN)	<b>N</b>	Heat conductivity > 180 W/mK
<b>Operating and mounting temperatures</b>		
Operating temperature up to 80°C (standard); Mounting temperature ≤ 130 °C**	-	Standard performance. Melting point of TEC's solder T=139°C
Operating temperature up to 120 °C, max Mounting temperature ≤ 130 °C**	<b>HT(120)</b>	Melting point of TEC's solder T=139°C
Operating temperature up to 150 °C, max Mounting temperature ≤ 170 °C**	<b>HT(150)***</b>	Melting point of TEC's solder T=183°C (Pb-Sn)***
Operating temperature up to 200 °C, max Mounting temperature ≤ 220 °C**	<b>HT(200)</b>	Melting point of TEC's solder T= 232 °C
<b>Parallelism and flatness of mounting surfaces</b>		
Flatness 0,02 mm; Parallelism 0,03 mm	<b>L1</b>	Standard performance. Height tolerance ± 0,05 mm
Flatness 0,015 mm; Parallelism 0,02 mm	<b>L2</b>	Height tolerance ± 0,025mm
Flatness 0,01 mm; Parallelism 0,01 mm	<b>L3</b>	Height tolerance ± 0,015mm
<b>Metallization of cold and (or) hot sides</b>		
Metallization of cold (mc) and (or) hot side of TEC	mc95, mh95, mm117 etc.	Solder tinning (melting temperatures 95 °C, 117 °C, 139 °C or 183 °C)
Gold plating	mcAu, mhAu, mmAu	0,2-1 micron thickness
Nickel plating	mcNi, mhNi, mmNi	
<b>Other standard and additional options</b>		
Sealants: epoxy, silicon, urethane, conformal coating	<b>E, S, U, Cc</b>	
Special performance for operation under conditions of temperature cycling	<b>C</b>	Standard performance. > 10 <sup>5</sup> cycles +40°C /+90°C
Tolerance of Rac value		±10% for Rac>0,15 Ohm ± 15% for Rac≤ 0,15 Ohm
Tolerance of length (dimensions A, A1) and width (dimensions B, B1) or external diameter (dimension D)		+0,5/-0,2mm
Tolerance of internal diameter (dimension d for TECs with hole)		+0,2/-0,5mm
Lead tabs orientation for rectangular TECs	-	On the long side - standard
Type and length of lead wires (standard length 120 mm)	-	By customer's requirements
Assembling into arrays	-	
Connectors attachment	-	
TEC could be mounted on heatsink, cold block or into a case	-	

(\*) - the notations shown are used to notate additional options in TECs name (please refer to System of Notation section below);

(\*\*) - the maximum mounting temperature influence on the module must not exceed 2 minutes;

(\*\*\*) - attention! This option does not meet ROHS requirements.



## System of notation:

A universal abbreviation is used to notate single-stage TECs:  
**TB-N-C-h**, where:

- TB** — product abbreviation — thermoelectric battery (TEC);
- N** — number of thermocouples in the TEC;
- C** — length of the edge of the thermoelectric element basis (in millimeters);
- h** — height of the thermoelectric element (in millimeters).

**For example:** TB-161-1,4-1,5 consists of 161 thermocouples (322 thermoelectric elements), every element has the cross-section of 1,4x1,4 mm and is 1,5 mm high.

Additional index BB in abbreviation (TB-N-C-h-BB) is used only for TECs with hole or/and for TECs of round shape:

- CH** — for rectangular TEC with a central hole (for example TB-43-1,0-0,8CH);
- CHR** — for round TECs with a central hole (for example TB-19-1,0-1,3CHR);
- R** — for round TECs (for example TB-253-1,4-1,5R).

Each type of high efficient and two-section TECs has additional individual name.

Two-section TECs with four lead tabs also have abbreviations indicating number of thermocouples in the first and the second sections.



info@amstechnologies.com  
www.amstechnologies-webshop.com



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## Examples:

1. FROST-72 HT(150) means thermoelectric cooler FROST-72, with max operating temperature of 150°C, with substrate material of aluminum oxide (alumina).
2. DRIFT-0,8 HT(200) mmAu N means thermoelectric cooler DRIFT-0,8 with max operating temperature 200°C, with substrate material of aluminum nitride. Cold and hot surfaces are coated with gold.

## Environmental Safety Features:

The thermoelectric coolers do not contain lead or any other forbidden materials according to RoHS directive requirements.

