

Ready-to-Use Thermoelectric Cooling System

maximum cooling power
 best operating voltage
 best operating current

} depending on ambient temperature and cooling temperature:

cooling temperature	ambient temperature (free air, 1013 hPa, 80% relative humidity)											
	10°C	15°C	20°C	25°C	30°C	35°C	40°C	45°C	50°C	55°C	60°C	
-40°C												
-35°C												
-30°C	1.1 W 11.1 V 1.4 A	0.3 W 11.3 V 1.4 A										
-25°C	2.2 W 11.1 V 1.4 A	1.4 W 11.3 V 1.4 A	0.6 W 11.5 V 1.4 A									
-20°C	3.3 W 11.2 V 1.4 A	2.5 W 11.3 V 1.4 A	1.7 W 11.5 V 1.4 A	0.9 W 11.7 V 1.4 A	0.1 W 11.9 V 1.4 A							
-15°C	4.4 W 11.2 V 1.5 A	3.6 W 11.4 V 1.5 A	2.8 W 11.6 V 1.5 A	2.0 W 11.8 V 1.5 A	1.2 W 12.0 V 1.5 A	0.4 W 12.2 V 1.5 A						
-10°C	5.5 W 11.2 V 1.5 A	4.7 W 11.4 V 1.5 A	3.9 W 11.6 V 1.5 A	3.1 W 11.8 V 1.5 A	2.3 W 12.0 V 1.5 A	1.5 W 12.2 V 1.5 A	0.7 W 12.4 V 1.5 A					
-5°C	6.6 W 11.2 V 1.5 A	5.8 W 11.4 V 1.5 A	5.0 W 11.6 V 1.5 A	4.2 W 11.8 V 1.5 A	3.4 W 12.0 V 1.5 A	2.6 W 12.2 V 1.5 A	1.8 W 12.4 V 1.5 A	1.0 W 12.6 V 1.5 A	0.3 W 12.8 V 1.5 A			
0°C	7.7 W 11.3 V 1.6 A	6.9 W 11.5 V 1.6 A	6.1 W 11.7 V 1.6 A	5.3 W 11.9 V 1.6 A	4.5 W 12.0 V 1.6 A	3.7 W 12.2 V 1.5 A	3.0 W 12.4 V 1.5 A	2.2 W 12.6 V 1.5 A	1.4 W 12.8 V 1.5 A	0.6 W 13.0 V 1.5 A		
5°C	8.8 W 11.3 V 1.6 A	8.1 W 11.5 V 1.6 A	7.3 W 11.7 V 1.6 A	6.5 W 11.9 V 1.6 A	5.7 W 12.1 V 1.6 A	4.9 W 12.3 V 1.6 A	4.1 W 12.5 V 1.6 A	3.3 W 12.7 V 1.6 A	2.5 W 12.9 V 1.6 A	1.7 W 13.0 V 1.6 A	0.9 W 13.2 V 1.6 A	
10°C	10.0 W 11.3 V 1.6 A	9.2 W 11.5 V 1.6 A	8.4 W 11.7 V 1.6 A	7.6 W 11.9 V 1.6 A	6.8 W 12.1 V 1.6 A	6.0 W 12.3 V 1.6 A	5.2 W 12.5 V 1.6 A	4.4 W 12.7 V 1.6 A	3.6 W 12.9 V 1.6 A	2.8 W 13.1 V 1.6 A	2.0 W 13.3 V 1.6 A	
15°C	11.1 W 11.4 V 1.7 A	10.3 W 11.5 V 1.7 A	9.5 W 11.7 V 1.7 A	8.7 W 11.9 V 1.7 A	7.9 W 12.1 V 1.7 A	7.1 W 12.3 V 1.6 A	6.3 W 12.5 V 1.6 A	5.5 W 12.7 V 1.6 A	4.8 W 12.9 V 1.6 A	4.0 W 13.1 V 1.6 A	3.2 W 13.3 V 1.6 A	
20°C	12.3 W 11.4 V 1.7 A	11.5 W 11.6 V 1.7 A	10.7 W 11.8 V 1.7 A	9.9 W 12.0 V 1.7 A	9.1 W 12.2 V 1.7 A	8.3 W 12.4 V 1.7 A	7.5 W 12.6 V 1.7 A	6.7 W 12.7 V 1.7 A	5.9 W 12.9 V 1.7 A	5.1 W 13.1 V 1.7 A	4.3 W 13.3 V 1.7 A	
25°C	13.4 W 11.4 V 1.7 A	12.6 W 11.6 V 1.7 A	11.8 W 11.8 V 1.7 A	11.0 W 12.0 V 1.7 A	10.2 W 12.2 V 1.7 A	9.4 W 12.4 V 1.7 A	8.6 W 12.6 V 1.7 A	7.8 W 12.8 V 1.7 A	7.0 W 13.0 V 1.7 A	6.2 W 13.2 V 1.7 A	5.4 W 13.4 V 1.7 A	
30°C	14.6 W 11.4 V 1.8 A	13.8 W 11.6 V 1.8 A	13.0 W 11.8 V 1.8 A	12.2 W 12.0 V 1.8 A	11.4 W 12.2 V 1.7 A	10.6 W 12.4 V 1.7 A	9.8 W 12.6 V 1.7 A	9.0 W 12.8 V 1.7 A	8.2 W 13.0 V 1.7 A	7.4 W 13.2 V 1.7 A	6.6 W 13.4 V 1.7 A	
35°C	15.8 W 11.5 V 1.8 A	15.0 W 11.7 V 1.8 A	14.2 W 11.9 V 1.8 A	13.4 W 12.1 V 1.8 A	12.6 W 12.3 V 1.8 A	11.8 W 12.5 V 1.8 A	11.0 W 12.6 V 1.8 A	10.2 W 12.8 V 1.8 A	9.4 W 13.0 V 1.8 A	8.6 W 13.2 V 1.8 A	7.8 W 13.4 V 1.8 A	
40°C	16.9 W 11.5 V 1.8 A	16.1 W 11.7 V 1.8 A	15.3 W 11.9 V 1.8 A	14.5 W 12.1 V 1.8 A	13.7 W 12.3 V 1.8 A	12.9 W 12.5 V 1.8 A	12.1 W 12.7 V 1.8 A	11.3 W 12.9 V 1.8 A	10.5 W 13.1 V 1.8 A	9.7 W 13.3 V 1.8 A	8.9 W 13.5 V 1.8 A	
45°C	18.1 W 11.5 V 1.9 A	17.3 W 11.7 V 1.9 A	16.5 W 11.9 V 1.9 A	15.7 W 12.1 V 1.8 A	14.9 W 12.3 V 1.8 A	14.1 W 12.5 V 1.8 A	13.3 W 12.7 V 1.8 A	12.5 W 12.9 V 1.8 A	11.7 W 13.1 V 1.8 A	10.9 W 13.3 V 1.8 A	10.1 W 13.5 V 1.8 A	
50°C	19.3 W 11.6 V 1.9 A	18.5 W 11.8 V 1.9 A	17.7 W 12.0 V 1.9 A	16.9 W 12.2 V 1.9 A	16.1 W 12.4 V 1.9 A	15.3 W 12.5 V 1.9 A	14.5 W 12.7 V 1.9 A	13.7 W 12.9 V 1.9 A	12.9 W 13.1 V 1.9 A	12.1 W 13.3 V 1.9 A	11.3 W 13.5 V 1.8 A	
55°C	20.5 W 11.6 V 1.9 A	19.7 W 11.8 V 1.9 A	18.9 W 12.0 V 1.9 A	18.1 W 12.2 V 1.9 A	17.3 W 12.4 V 1.9 A	16.5 W 12.6 V 1.9 A	15.7 W 12.8 V 1.9 A	14.9 W 13.0 V 1.9 A	14.1 W 13.2 V 1.9 A	13.3 W 13.4 V 1.9 A	12.5 W 13.6 V 1.9 A	
60°C	21.7 W 11.6 V 2.0 A	20.9 W 11.8 V 2.0 A	20.1 W 12.0 V 1.9 A	19.3 W 12.2 V 1.9 A	18.5 W 12.4 V 1.9 A	17.7 W 12.6 V 1.9 A	16.9 W 12.8 V 1.9 A	16.1 W 13.0 V 1.9 A	15.3 W 13.2 V 1.9 A	14.5 W 13.4 V 1.9 A	13.7 W 13.6 V 1.9 A	
65°C	22.9 W 11.7 V 2.0 A	22.1 W 11.9 V 2.0 A	21.3 W 12.1 V 2.0 A	20.5 W 12.3 V 2.0 A	19.7 W 12.4 V 2.0 A	18.9 W 12.6 V 2.0 A	18.1 W 12.8 V 2.0 A	17.3 W 13.0 V 2.0 A	16.5 W 13.2 V 2.0 A	15.7 W 13.4 V 1.9 A	14.9 W 13.6 V 1.9 A	
70°C	24.2 W 11.7 V 2.0 A	23.4 W 11.9 V 2.0 A	22.6 W 12.1 V 2.0 A	21.7 W 12.3 V 2.0 A	20.9 W 12.5 V 2.0 A	20.1 W 12.7 V 2.0 A	19.3 W 12.9 V 2.0 A	18.5 W 13.1 V 2.0 A	17.7 W 13.3 V 2.0 A	16.9 W 13.5 V 2.0 A	16.1 W 13.7 V 2.0 A	

In free air operations of the cold side water condenses at a relative humidity of: 80% 60% 40% 20% freezes

The cooling power of the system is decreased by 0.63 W for 1 g/h condensed water and additional by 0.11 W for 1 g/h frozen water.

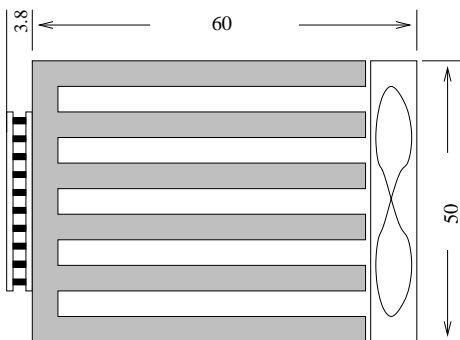
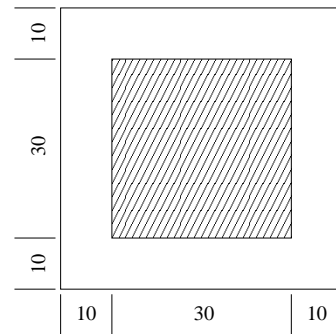
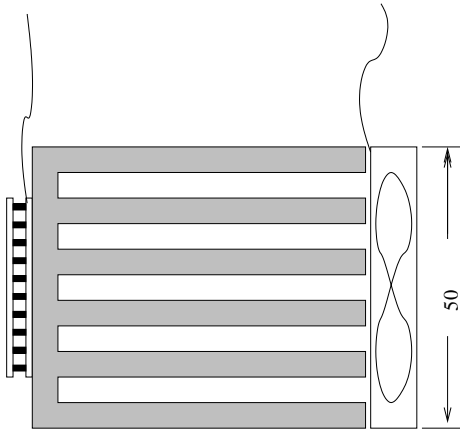
The cooling power of the system may also be decreased by air convection at the cold side and by heatflow through insulation materials.

The thermal conductivity of the foam insulation material which is used in this system is about 30 mW/K · m.

The dynamical performance of the system is limited by the thermal capacity of the cold side which is 2.8 mW · h/K.

If water is condensed at the cold side the thermal capacity is increased by 1.16 mW · h/K · g of water.

Ready-to-Use Thermoelectric Cooling System



General Technical Data:

mechanical dimensions:	mm
mechanical tolerances:	± 0.5 mm
electrical tolerances:	± 5 %
thermal tolerances:	± 3 %
(regarding to absolute temperatures [K])	
number of fans:	1
data of each fan:	50 mm axial 15 m ³ /h 12.0 V @ 1.0 W
heatsink:	≤ 0.85 K/W
peltier element:	TEC2L-30-30-23/73-CS
total mass:	0.2 kg

Ready-to-Use Thermoelectric Cooling System

maximum cooling power
 best operating voltage
 best operating current

} depending on ambient temperature and cooling temperature:

cooling temperature	ambient temperature (free air, 1013 hPa, 80% relative humidity)										
	10°C	15°C	20°C	25°C	30°C	35°C	40°C	45°C	50°C	55°C	60°C
-40°C	0.3 W 12.4 V 2.5 A										
-35°C	2.2 W 12.4 V 2.6 A	0.9 W 12.6 V 2.6 A									
-30°C	4.1 W 12.4 V 2.7 A	2.8 W 12.6 V 2.7 A	1.5 W 12.8 V 2.7 A	0.1 W 13.1 V 2.7 A							
-25°C	6.1 W 12.4 V 2.7 A	4.7 W 12.7 V 2.7 A	3.4 W 12.9 V 2.7 A	2.0 W 13.1 V 2.7 A	0.7 W 13.3 V 2.7 A						
-20°C	8.0 W 12.5 V 2.8 A	6.7 W 12.7 V 2.8 A	5.3 W 12.9 V 2.8 A	4.0 W 13.1 V 2.8 A	2.6 W 13.3 V 2.8 A	1.3 W 13.5 V 2.8 A					
-15°C	10.0 W 12.5 V 2.8 A	8.6 W 12.7 V 2.8 A	7.3 W 12.9 V 2.8 A	6.0 W 13.2 V 2.8 A	4.6 W 13.4 V 2.8 A	3.3 W 13.6 V 2.8 A	1.9 W 13.8 V 2.8 A	0.6 W 14.0 V 2.8 A			
-10°C	12.0 W 12.5 V 2.9 A	10.6 W 12.8 V 2.9 A	9.3 W 13.0 V 2.9 A	7.9 W 13.2 V 2.9 A	6.6 W 13.4 V 2.9 A	5.2 W 13.6 V 2.9 A	3.9 W 13.8 V 2.9 A	2.5 W 14.0 V 2.9 A	1.2 W 14.3 V 2.9 A		
-5°C	14.0 W 12.6 V 3.0 A	12.6 W 12.8 V 3.0 A	11.3 W 13.0 V 3.0 A	9.9 W 13.2 V 3.0 A	8.6 W 13.4 V 2.9 A	7.2 W 13.6 V 2.9 A	5.9 W 13.9 V 2.9 A	4.5 W 14.1 V 2.9 A	3.2 W 14.3 V 2.9 A	1.8 W 14.5 V 2.9 A	0.5 W 14.7 V 2.9 A
0°C	16.0 W 12.6 V 3.0 A	14.6 W 12.8 V 3.0 A	13.3 W 13.0 V 3.0 A	11.9 W 13.3 V 3.0 A	10.6 W 13.5 V 3.0 A	9.2 W 13.7 V 3.0 A	7.9 W 13.9 V 3.0 A	6.5 W 14.1 V 3.0 A	5.2 W 14.3 V 3.0 A	3.8 W 14.5 V 3.0 A	2.5 W 14.8 V 3.0 A
5°C	18.0 W 12.6 V 3.1 A	16.6 W 12.9 V 3.1 A	15.3 W 13.1 V 3.1 A	13.9 W 13.3 V 3.1 A	12.6 W 13.5 V 3.1 A	11.2 W 13.7 V 3.1 A	9.9 W 13.9 V 3.1 A	8.5 W 14.1 V 3.0 A	7.2 W 14.4 V 3.0 A	5.8 W 14.6 V 3.0 A	4.5 W 14.8 V 3.0 A
10°C	20.0 W 12.7 V 3.1 A	18.7 W 12.9 V 3.1 A	17.3 W 13.1 V 3.1 A	16.0 W 13.3 V 3.1 A	14.6 W 13.5 V 3.1 A	13.3 W 13.8 V 3.1 A	11.9 W 14.0 V 3.1 A	10.5 W 14.2 V 3.1 A	9.2 W 14.4 V 3.1 A	7.8 W 14.6 V 3.1 A	6.5 W 14.8 V 3.1 A
15°C	22.1 W 12.7 V 3.2 A	20.7 W 12.9 V 3.2 A	19.4 W 13.1 V 3.2 A	18.0 W 13.4 V 3.2 A	16.6 W 13.6 V 3.2 A	15.3 W 13.8 V 3.2 A	13.9 W 14.0 V 3.2 A	12.6 W 14.2 V 3.2 A	11.2 W 14.4 V 3.2 A	9.9 W 14.6 V 3.2 A	8.5 W 14.8 V 3.1 A
20°C	24.1 W 12.7 V 3.3 A	22.8 W 13.0 V 3.3 A	21.4 W 13.2 V 3.3 A	20.1 W 13.4 V 3.2 A	18.7 W 13.6 V 3.2 A	17.3 W 13.8 V 3.2 A	16.0 W 14.0 V 3.2 A	14.6 W 14.3 V 3.2 A	13.3 W 14.5 V 3.2 A	11.9 W 14.7 V 3.2 A	10.6 W 14.9 V 3.2 A
25°C	26.2 W 12.8 V 3.3 A	24.8 W 13.0 V 3.3 A	23.5 W 13.2 V 3.3 A	22.1 W 13.4 V 3.3 A	20.8 W 13.6 V 3.3 A	19.4 W 13.9 V 3.3 A	18.1 W 14.1 V 3.3 A	16.7 W 14.3 V 3.3 A	15.3 W 14.5 V 3.3 A	14.0 W 14.7 V 3.3 A	12.6 W 14.9 V 3.3 A
30°C	28.3 W 12.8 V 3.4 A	26.9 W 13.0 V 3.4 A	25.6 W 13.2 V 3.4 A	24.2 W 13.5 V 3.4 A	22.8 W 13.7 V 3.4 A	21.5 W 13.9 V 3.4 A	20.1 W 14.1 V 3.3 A	18.8 W 14.3 V 3.3 A	17.4 W 14.5 V 3.3 A	16.1 W 14.7 V 3.3 A	14.7 W 15.0 V 3.3 A
35°C	30.4 W 12.8 V 3.4 A	29.0 W 13.1 V 3.4 A	27.7 W 13.3 V 3.4 A	26.3 W 13.5 V 3.4 A	24.9 W 13.7 V 3.4 A	23.6 W 13.9 V 3.4 A	22.2 W 14.1 V 3.4 A	20.9 W 14.4 V 3.4 A	19.5 W 14.6 V 3.4 A	18.1 W 14.8 V 3.4 A	16.8 W 15.0 V 3.4 A
40°C	32.5 W 12.9 V 3.5 A	31.1 W 13.1 V 3.5 A	29.8 W 13.3 V 3.5 A	28.4 W 13.5 V 3.5 A	27.0 W 13.7 V 3.5 A	25.7 W 14.0 V 3.5 A	24.3 W 14.2 V 3.5 A	23.0 W 14.4 V 3.5 A	21.6 W 14.6 V 3.5 A	20.2 W 14.8 V 3.4 A	18.9 W 15.0 V 3.4 A
45°C	34.6 W 12.9 V 3.6 A	33.3 W 13.1 V 3.6 A	31.9 W 13.3 V 3.5 A	30.5 W 13.5 V 3.5 A	29.2 W 13.8 V 3.5 A	27.8 W 14.0 V 3.5 A	26.4 W 14.2 V 3.5 A	25.1 W 14.4 V 3.5 A	23.7 W 14.7 V 3.5 A	22.4 W 14.9 V 3.5 A	21.0 W 15.1 V 3.5 A
50°C	36.8 W 12.9 V 3.6 A	35.4 W 13.2 V 3.6 A	34.0 W 13.4 V 3.6 A	32.7 W 13.6 V 3.6 A	31.3 W 13.8 V 3.6 A	29.9 W 14.0 V 3.6 A	28.6 W 14.3 V 3.6 A	27.2 W 14.5 V 3.6 A	25.8 W 14.7 V 3.6 A	24.5 W 14.9 V 3.6 A	23.1 W 15.1 V 3.6 A
55°C	38.9 W 13.0 V 3.7 A	37.5 W 13.2 V 3.7 A	36.2 W 13.4 V 3.7 A	34.8 W 13.6 V 3.7 A	33.4 W 13.9 V 3.7 A	32.1 W 14.1 V 3.6 A	30.7 W 14.3 V 3.6 A	29.4 W 14.5 V 3.6 A	28.0 W 14.7 V 3.6 A	26.6 W 14.9 V 3.6 A	25.3 W 15.2 V 3.6 A
60°C	41.1 W 13.0 V 3.7 A	39.7 W 13.2 V 3.7 A	38.3 W 13.5 V 3.7 A	37.0 W 13.7 V 3.7 A	35.6 W 13.9 V 3.7 A	34.2 W 14.1 V 3.7 A	32.9 W 14.3 V 3.7 A	31.5 W 14.5 V 3.7 A	30.1 W 14.8 V 3.7 A	28.8 W 15.0 V 3.7 A	27.4 W 15.2 V 3.7 A
65°C	43.3 W 13.1 V 3.8 A	41.9 W 13.3 V 3.8 A	40.5 W 13.5 V 3.8 A	39.1 W 13.7 V 3.8 A	37.8 W 13.9 V 3.8 A	36.4 W 14.1 V 3.8 A	35.0 W 14.4 V 3.8 A	33.7 W 14.6 V 3.8 A	32.3 W 14.8 V 3.7 A	30.9 W 15.0 V 3.7 A	29.6 W 15.2 V 3.7 A
70°C	45.4 W 13.1 V 3.9 A	44.1 W 13.3 V 3.8 A	42.7 W 13.5 V 3.8 A	41.3 W 13.7 V 3.8 A	40.0 W 14.0 V 3.8 A	38.6 W 14.2 V 3.8 A	37.2 W 14.4 V 3.8 A	35.9 W 14.6 V 3.8 A	34.5 W 14.8 V 3.8 A	33.1 W 15.1 V 3.8 A	31.7 W 15.3 V 3.8 A

In free air operations of the cold side water condenses at a relative humidity of: 80% 60% 40% 20% freezes

The cooling power of the system is decreased by 0.63 W for 1 g/h condensed water and additional by 0.11 W for 1 g/h frozen water.

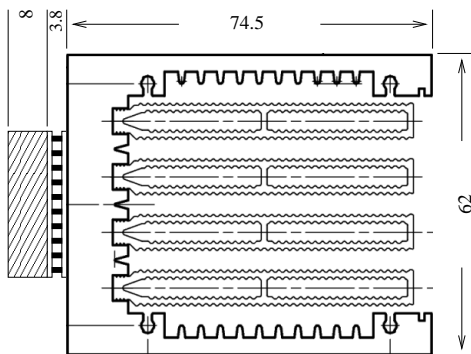
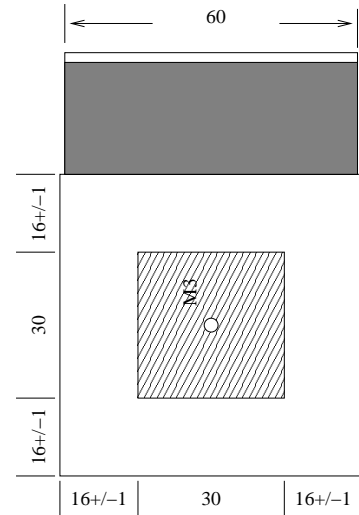
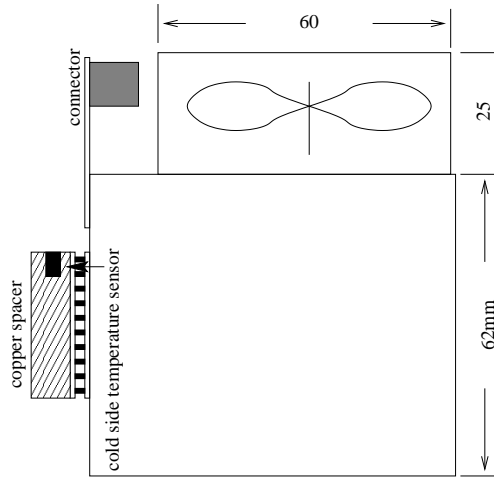
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The thermal conductivity of the foam insulation material which is used in this system is about 30 mW/K · m.

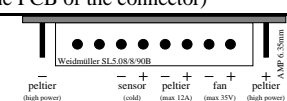
The dynamical performance of the system is limited by the thermal capacity of the cold side which is 6.9 mW · h/K.

If water is condensed at the cold side the thermal capacity is increased by 1.16 mW · h/K · g of water.

Ready-to-Use Thermoelectric Cooling System



General Technical Data:

mechanical dimensions:	mm
mechanical tolerances:	± 0.5 mm
electrical tolerances:	± 5 %
thermal tolerances:	± 3 %
(regarding to absolute temperatures [K])	
number of fans:	1
data of each fan:	60 mm axial 56 m ³ /h 12.0 V @ 3.0 W
(a 12V regulator is placed on the PCB of the connector)	
connector sheme:	
heatsink:	hollow fin profile ≤ 0.34 K/W
at 5 m/s air flow:	typ. 0.31 K/W
peltier element:	TEC1H-30-30-44/80-BS
temperature sensor:	LM335 or PT100
	please specify on order 0
total mass:	0.5 kg

A cost reduced „light“ version without connector PCB and temperature sensor is available.

As an option are 30mm extension tubes between fan and heatsink available which cause a performance enhancement by up to 20% and less noise!

Ready-to-Use Thermoelectric Cooling System

maximum cooling power } depending on ambient temperature and cooling temperature:
 best operating voltage }
 best operating current }

cooling temperature	ambient temperature (free air, 1013 hPa, 80% relative humidity)										
	10°C	15°C	20°C	25°C	30°C	35°C	40°C	45°C	50°C	55°C	60°C
-40°C	1.0 W 12.7 V 5.8 A										
-35°C	5.1 W 12.7 V 5.9 A	2.2 W 12.9 V 5.9 A									
-30°C	9.3 W 12.7 V 6.0 A	6.4 W 13.0 V 6.0 A	3.5 W 13.2 V 6.0 A	0.6 W 13.4 V 6.0 A							
-25°C	13.5 W 12.8 V 6.2 A	10.6 W 13.0 V 6.2 A	7.7 W 13.2 V 6.1 A	4.8 W 13.4 V 6.1 A	1.8 W 13.6 V 6.1 A						
-20°C	17.8 W 12.8 V 6.3 A	14.9 W 13.0 V 6.3 A	11.9 W 13.2 V 6.3 A	9.0 W 13.5 V 6.3 A	6.1 W 13.7 V 6.3 A	3.2 W 13.9 V 6.2 A	0.2 W 14.1 V 6.2 A				
-15°C	22.1 W 12.8 V 6.4 A	19.1 W 13.1 V 6.4 A	16.2 W 13.3 V 6.4 A	13.3 W 13.5 V 6.4 A	10.4 W 13.7 V 6.4 A	7.4 W 13.9 V 6.4 A	4.5 W 14.1 V 6.4 A	1.6 W 14.4 V 6.4 A			
-10°C	26.4 W 12.9 V 6.6 A	23.5 W 13.1 V 6.5 A	20.5 W 13.3 V 6.5 A	17.6 W 13.5 V 6.5 A	14.7 W 13.7 V 6.5 A	11.7 W 14.0 V 6.5 A	8.8 W 14.2 V 6.5 A	5.9 W 14.4 V 6.5 A	2.9 W 14.6 V 6.5 A		
-5°C	30.7 W 12.9 V 6.7 A	27.8 W 13.1 V 6.7 A	24.9 W 13.3 V 6.7 A	21.9 W 13.6 V 6.7 A	19.0 W 13.8 V 6.6 A	16.1 W 14.0 V 6.6 A	13.1 W 14.2 V 6.6 A	10.2 W 14.4 V 6.6 A	7.3 W 14.6 V 6.6 A	4.3 W 14.9 V 6.6 A	1.4 W 15.1 V 6.6 A
0°C	35.1 W 12.9 V 6.8 A	32.2 W 13.2 V 6.8 A	29.2 W 13.4 V 6.8 A	26.3 W 13.6 V 6.8 A	23.3 W 13.8 V 6.8 A	20.4 W 14.0 V 6.8 A	17.5 W 14.2 V 6.8 A	14.5 W 14.5 V 6.7 A	11.6 W 14.7 V 6.7 A	8.7 W 14.9 V 6.7 A	5.7 W 15.1 V 6.7 A
5°C	39.5 W 13.0 V 6.9 A	36.5 W 13.2 V 6.9 A	33.6 W 13.4 V 6.9 A	30.7 W 13.6 V 6.9 A	27.7 W 13.8 V 6.9 A	24.8 W 14.1 V 6.9 A	21.9 W 14.3 V 6.9 A	18.9 W 14.5 V 6.9 A	16.0 W 14.7 V 6.9 A	13.0 W 14.9 V 6.9 A	10.1 W 15.1 V 6.8 A
10°C	43.9 W 13.0 V 7.1 A	41.0 W 13.2 V 7.1 A	38.0 W 13.5 V 7.1 A	35.1 W 13.7 V 7.0 A	32.1 W 13.9 V 7.0 A	29.2 W 14.1 V 7.0 A	26.3 W 14.3 V 7.0 A	23.3 W 14.5 V 7.0 A	20.4 W 14.8 V 7.0 A	17.4 W 15.0 V 7.0 A	14.5 W 15.2 V 7.0 A
15°C	48.3 W 13.1 V 7.2 A	45.4 W 13.3 V 7.2 A	42.5 W 13.5 V 7.2 A	39.5 W 13.7 V 7.2 A	36.6 W 13.9 V 7.2 A	33.6 W 14.1 V 7.2 A	30.7 W 14.4 V 7.1 A	27.8 W 14.6 V 7.1 A	24.8 W 14.8 V 7.1 A	21.9 W 15.0 V 7.1 A	18.9 W 15.2 V 7.1 A
20°C	52.8 W 13.1 V 7.3 A	49.9 W 13.3 V 7.3 A	46.9 W 13.5 V 7.3 A	44.0 W 13.7 V 7.3 A	41.0 W 14.0 V 7.3 A	38.1 W 14.2 V 7.3 A	35.2 W 14.4 V 7.3 A	32.2 W 14.6 V 7.3 A	29.3 W 14.8 V 7.3 A	26.3 W 15.1 V 7.2 A	23.4 W 15.3 V 7.2 A
25°C	57.3 W 13.1 V 7.5 A	54.4 W 13.3 V 7.5 A	51.4 W 13.6 V 7.4 A	48.5 W 13.8 V 7.4 A	45.5 W 14.0 V 7.4 A	42.6 W 14.2 V 7.4 A	39.7 W 14.4 V 7.4 A	36.7 W 14.6 V 7.4 A	33.8 W 14.9 V 7.4 A	30.8 W 14.9 V 7.4 A	27.9 W 15.1 V 7.4 A
30°C	61.9 W 13.2 V 7.6 A	58.9 W 13.4 V 7.6 A	56.0 W 13.6 V 7.6 A	53.0 W 13.8 V 7.6 A	50.1 W 14.0 V 7.6 A	47.1 W 14.3 V 7.5 A	44.2 W 14.5 V 7.5 A	41.2 W 14.7 V 7.5 A	38.3 W 14.9 V 7.5 A	35.3 W 15.1 V 7.5 A	32.4 W 15.3 V 7.5 A
35°C	66.4 W 13.2 V 7.7 A	63.5 W 13.4 V 7.7 A	60.5 W 13.6 V 7.7 A	57.6 W 13.9 V 7.7 A	54.6 W 14.1 V 7.7 A	51.7 W 14.3 V 7.7 A	48.7 W 14.5 V 7.7 A	45.8 W 14.7 V 7.6 A	42.8 W 14.9 V 7.6 A	39.9 W 15.1 V 7.6 A	36.9 W 15.4 V 7.6 A
40°C	71.0 W 13.2 V 7.8 A	68.1 W 13.5 V 7.8 A	65.1 W 13.7 V 7.8 A	62.1 W 13.9 V 7.8 A	59.2 W 14.1 V 7.8 A	56.2 W 14.3 V 7.8 A	53.3 W 14.5 V 7.8 A	50.3 W 14.8 V 7.8 A	47.4 W 15.0 V 7.8 A	44.4 W 15.2 V 7.8 A	41.5 W 15.4 V 7.7 A
45°C	75.6 W 13.3 V 8.0 A	72.7 W 13.5 V 8.0 A	69.7 W 13.7 V 8.0 A	66.8 W 13.9 V 7.9 A	63.8 W 14.1 V 7.9 A	60.8 W 14.4 V 7.9 A	57.9 W 14.6 V 7.9 A	54.9 W 14.8 V 7.9 A	52.0 W 15.0 V 7.9 A	49.0 W 15.2 V 7.9 A	46.1 W 15.5 V 7.9 A
50°C	80.3 W 13.3 V 8.1 A	77.3 W 13.5 V 8.1 A	74.3 W 13.7 V 8.1 A	71.4 W 14.0 V 8.1 A	68.4 W 14.2 V 8.1 A	65.5 W 14.4 V 8.1 A	62.5 W 14.6 V 8.0 A	59.6 W 14.8 V 8.0 A	56.6 W 15.1 V 8.0 A	53.6 W 15.3 V 8.0 A	50.7 W 15.5 V 8.0 A
55°C	84.9 W 13.3 V 8.2 A	82.0 W 13.6 V 8.2 A	79.0 W 13.8 V 8.2 A	76.0 W 14.0 V 8.2 A	73.1 W 14.2 V 8.2 A	70.1 W 14.4 V 8.2 A	67.2 W 14.7 V 8.2 A	64.2 W 14.9 V 8.2 A	61.3 W 15.1 V 8.1 A	58.3 W 15.3 V 8.1 A	55.3 W 15.5 V 8.1 A
60°C	89.6 W 13.4 V 8.4 A	86.7 W 13.6 V 8.4 A	83.7 W 13.8 V 8.3 A	80.7 W 14.0 V 8.3 A	77.8 W 14.3 V 8.3 A	74.8 W 14.5 V 8.3 A	71.9 W 14.7 V 8.3 A	68.9 W 14.9 V 8.3 A	65.9 W 15.1 V 8.3 A	63.0 W 15.4 V 8.3 A	60.0 W 15.6 V 8.3 A
65°C	94.3 W 13.4 V 8.5 A	91.4 W 13.6 V 8.5 A	88.4 W 13.9 V 8.5 A	85.5 W 14.1 V 8.5 A	82.5 W 14.3 V 8.4 A	79.5 W 14.5 V 8.4 A	76.6 W 14.7 V 8.4 A	73.6 W 15.0 V 8.4 A	70.6 W 15.2 V 8.4 A	67.7 W 15.4 V 8.4 A	64.7 W 15.6 V 8.4 A
70°C	99.1 W 13.5 V 8.6 A	96.1 W 13.7 V 8.6 A	93.2 W 13.9 V 8.6 A	90.2 W 14.1 V 8.6 A	87.2 W 14.3 V 8.6 A	84.3 W 14.6 V 8.6 A	81.3 W 14.8 V 8.6 A	78.3 W 15.0 V 8.5 A	75.4 W 15.2 V 8.5 A	72.4 W 15.4 V 8.5 A	69.4 W 15.7 V 8.5 A

In free air operations of the cold side water condenses at a relative humidity of: 80% 60% 40% 20% freezes

The cooling power of the system is decreased by 0.63 W for 1 g/h condensed water and additional by 0.11 W for 1 g/h frozen water.

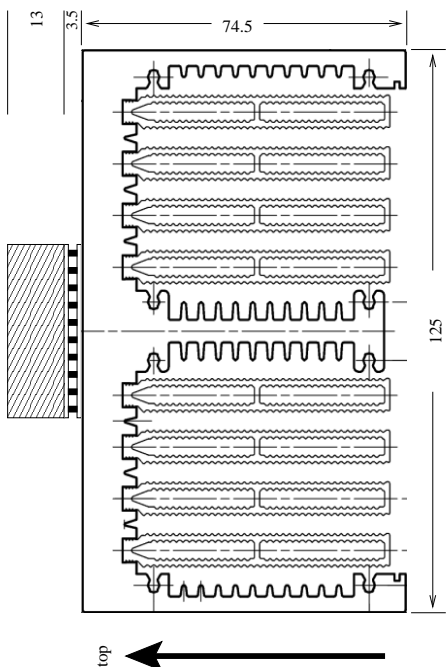
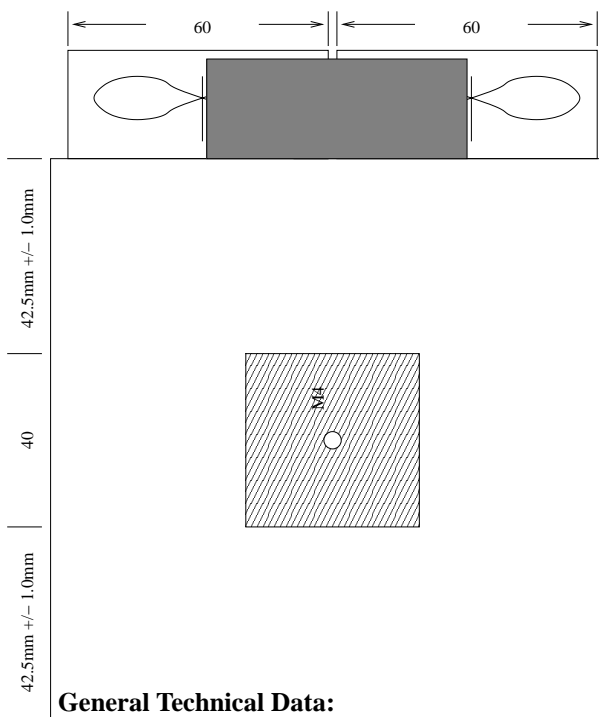
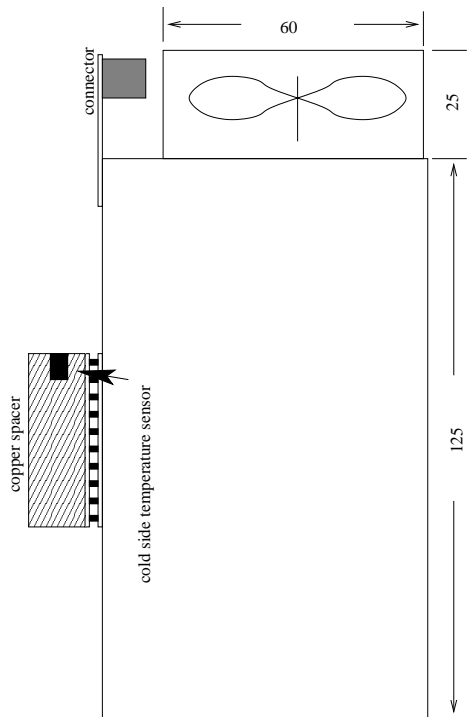
The cooling power of the system may also be decreased by air convection at the cold side and by heatflow through insulation materials.

The thermal conductivity of the foam insulation material which is used in this system is about 30mW/K·m.

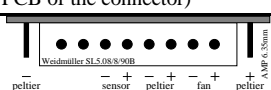
The dynamical performance of the system is limited by the thermal capacity of the cold side which is 19.4mW·h/K.

If water is condensed at the cold side the thermal capacity is increased by 1.16mW·h/K·g of water.

Ready-to-Use Thermoelectric Cooling System



General Technical Data:

	42.5mm +/- 1.0mm	40	42.5mm +/- 1.0mm
mechanical dimensions:	mm		
mechanical tolerances:	±0.5 mm		
electrical tolerances:	±5 %		
thermal tolerances:	±3 %		
(regarding to absolute temperatures [K])			
number of fans:	2		
data of each fan:	60mm axial 56m ³ /h 12.0V @ 3.0W		
(a 12V regulator is placed on the PCB of the connector)			
connector scheme:			
heatsink:	hollow fin profile ≤ 0.13 K/W		
at 5 m/s air flow:	typ. 0.11 K/W		
peltier element:	TEC1H-40-40-98/80-BS		
temperature sensor:	LM335 or PT100		
	please specify on order 0		
total mass:	1.8 kg		

A cost reduced „light“ version without connector PCB and temperature sensor is available.

As an option are 30mm extension tubes between fan and heatsink available which cause a performance enhancement by up to 20% and less noise!

Ready-to-Use Thermoelectric Cooling System

maximum cooling power
 best operating voltage
 best operating current

} depending on ambient temperature and cooling temperature:

cooling temperature	ambient temperature (free air, 1013 hPa, 80% relative humidity)											
	10°C	15°C	20°C	25°C	30°C	35°C	40°C	45°C	50°C	55°C	60°C	
-40°C												
-35°C												
-30°C	9.3 W 11.4 V 15.3 A	1.7 W 11.6 V 15.2 A										
-25°C	19.7 W 11.4 V 15.6 A	12.0 W 11.6 V 15.6 A	4.4 W 11.8 V 15.5 A									
-20°C	30.1 W 11.5 V 15.9 A	22.5 W 11.7 V 15.9 A	14.8 W 11.9 V 15.8 A	7.2 W 12.0 V 15.8 A								
-15°C	40.6 W 11.5 V 16.2 A	33.0 W 11.7 V 16.2 A	25.3 W 11.9 V 16.2 A	17.6 W 12.1 V 16.1 A	10.0 W 12.3 V 16.1 A	2.3 W 12.4 V 16.1 A						
-10°C	51.2 W 11.6 V 16.6 A	43.5 W 11.8 V 16.5 A	35.9 W 11.9 V 16.5 A	28.2 W 12.1 V 16.5 A	20.5 W 12.3 V 16.4 A	12.9 W 12.5 V 16.4 A	5.2 W 12.7 V 16.4 A					
-5°C	61.8 W 11.6 V 16.9 A	54.1 W 11.8 V 16.9 A	46.5 W 12.0 V 16.8 A	38.8 W 12.2 V 16.8 A	31.1 W 12.3 V 16.8 A	23.4 W 12.5 V 16.7 A	15.8 W 12.7 V 16.7 A	8.1 W 12.9 V 16.7 A	0.4 W 13.1 V 16.6 A			
0°C	72.5 W 11.7 V 17.2 A	64.8 W 11.8 V 17.2 A	57.1 W 12.0 V 17.1 A	49.4 W 12.2 V 17.1 A	41.8 W 12.4 V 17.1 A	34.1 W 12.6 V 17.0 A	26.4 W 12.8 V 17.0 A	18.7 W 12.9 V 17.0 A	11.1 W 13.1 V 16.9 A	3.4 W 13.3 V 16.9 A		
5°C	83.2 W 11.7 V 17.5 A	75.5 W 11.9 V 17.5 A	67.8 W 12.1 V 17.5 A	60.2 W 12.3 V 17.4 A	52.5 W 12.4 V 17.4 A	44.8 W 12.6 V 17.4 A	37.1 W 12.8 V 17.3 A	29.4 W 13.0 V 17.3 A	21.8 W 13.2 V 17.3 A	14.1 W 13.3 V 17.2 A	6.4 W 13.5 V 17.2 A	
10°C	94.0 W 11.8 V 17.9 A	86.3 W 11.9 V 17.8 A	78.6 W 12.1 V 17.8 A	70.9 W 12.3 V 17.8 A	63.2 W 12.5 V 17.7 A	55.6 W 12.7 V 17.7 A	47.9 W 12.8 V 17.6 A	40.2 W 13.0 V 17.6 A	32.5 W 13.2 V 17.6 A	24.8 W 13.4 V 17.5 A	17.1 W 13.6 V 17.5 A	
15°C	104.9 W 11.8 V 18.2 A	97.2 W 12.0 V 18.1 A	89.5 W 12.2 V 18.1 A	81.8 W 12.3 V 18.1 A	74.1 W 12.5 V 18.0 A	66.4 W 12.7 V 18.0 A	58.7 W 12.9 V 18.0 A	51.0 W 13.1 V 17.9 A	43.3 W 13.3 V 17.9 A	35.6 W 13.4 V 17.9 A	27.9 W 13.6 V 17.8 A	
20°C	115.8 W 11.8 V 18.5 A	108.1 W 12.0 V 18.5 A	100.4 W 12.2 V 18.4 A	92.7 W 12.4 V 18.4 A	85.0 W 12.6 V 18.4 A	77.3 W 12.8 V 18.3 A	69.6 W 13.0 V 18.3 A	61.9 W 13.2 V 18.3 A	54.2 W 13.3 V 18.2 A	46.5 W 13.5 V 18.2 A	38.8 W 13.7 V 18.1 A	
25°C	126.7 W 11.9 V 18.8 A	119.0 W 12.1 V 18.8 A	111.3 W 12.3 V 18.8 A	103.6 W 12.4 V 18.7 A	95.9 W 12.6 V 18.7 A	88.2 W 12.8 V 18.6 A	80.5 W 13.0 V 18.6 A	72.8 W 13.2 V 18.6 A	65.1 W 13.3 V 18.5 A	57.4 W 13.5 V 18.5 A	49.7 W 13.7 V 18.5 A	
30°C	137.8 W 11.9 V 19.1 A	130.0 W 12.1 V 19.1 A	122.3 W 12.3 V 19.1 A	114.6 W 12.5 V 19.0 A	106.9 W 12.7 V 19.0 A	99.2 W 12.9 V 19.0 A	91.5 W 13.0 V 18.9 A	83.8 W 13.2 V 18.9 A	76.0 W 13.4 V 18.9 A	68.3 W 13.6 V 18.8 A	60.6 W 13.8 V 18.8 A	
35°C	148.8 W 12.0 V 19.5 A	141.1 W 12.2 V 19.4 A	133.4 W 12.3 V 19.4 A	125.7 W 12.5 V 19.4 A	118.0 W 12.7 V 19.3 A	110.2 W 12.9 V 19.3 A	102.5 W 13.0 V 19.2 A	94.8 W 13.1 V 19.2 A	87.1 W 13.4 V 19.2 A	79.4 W 13.6 V 19.1 A	71.6 W 13.8 V 19.1 A	
40°C	160.0 W 12.0 V 19.8 A	152.3 W 12.2 V 19.7 A	144.5 W 12.4 V 19.7 A	136.8 W 12.6 V 19.7 A	129.1 W 12.8 V 19.6 A	121.3 W 12.9 V 19.6 A	113.6 W 13.0 V 19.6 A	105.9 W 13.1 V 19.5 A	98.2 W 13.3 V 19.5 A	90.4 W 13.7 V 19.4 A	82.7 W 13.9 V 19.4 A	
45°C	171.2 W 12.1 V 20.1 A	163.4 W 12.2 V 20.1 A	155.7 W 12.4 V 20.0 A	148.0 W 12.6 V 20.0 A	140.2 W 12.8 V 19.9 A	132.5 W 13.0 V 19.9 A	124.8 W 13.0 V 19.9 A	117.0 W 13.2 V 19.8 A	109.3 W 13.4 V 19.8 A	101.6 W 13.7 V 19.8 A	93.8 W 13.9 V 19.7 A	
50°C	182.4 W 12.1 V 20.4 A	174.7 W 12.3 V 20.4 A	166.9 W 12.5 V 20.3 A	159.2 W 12.7 V 20.3 A	151.5 W 12.8 V 20.3 A	143.7 W 13.0 V 20.2 A	136.0 W 13.2 V 20.2 A	128.2 W 13.4 V 20.2 A	120.5 W 13.6 V 20.1 A	112.8 W 13.8 V 20.1 A	105.0 W 13.9 V 20.0 A	
55°C	193.7 W 12.2 V 20.7 A	186.0 W 12.3 V 20.7 A	178.2 W 12.5 V 20.6 A	170.5 W 12.7 V 20.6 A	162.7 W 12.9 V 20.6 A	155.0 W 13.1 V 20.5 A	147.2 W 13.3 V 20.5 A	139.5 W 13.5 V 20.5 A	131.7 W 13.6 V 20.4 A	124.0 W 13.8 V 20.4 A	116.3 W 14.0 V 20.4 A	
60°C	205.1 W 12.2 V 21.0 A	197.3 W 12.4 V 21.0 A	189.6 W 12.6 V 21.0 A	181.8 W 12.8 V 20.9 A	174.1 W 12.9 V 20.9 A	166.3 W 13.1 V 20.9 A	158.6 W 13.3 V 20.8 A	150.8 W 13.5 V 20.8 A	143.1 W 13.7 V 20.7 A	135.3 W 13.9 V 20.7 A	127.6 W 14.0 V 20.7 A	
65°C	216.5 W 12.2 V 21.3 A	208.7 W 12.4 V 21.3 A	201.0 W 12.6 V 21.3 A	193.2 W 12.8 V 21.2 A	185.5 W 13.0 V 21.2 A	177.7 W 13.2 V 21.2 A	169.9 W 13.4 V 21.1 A	162.2 W 13.5 V 21.1 A	154.4 W 13.7 V 21.1 A	146.7 W 13.9 V 21.0 A	138.9 W 14.1 V 21.0 A	
70°C	228.0 W 12.3 V 21.7 A	220.2 W 12.5 V 21.6 A	212.4 W 12.7 V 21.6 A	204.7 W 12.8 V 21.5 A	196.9 W 13.0 V 21.5 A	189.1 W 13.2 V 21.5 A	181.4 W 13.4 V 21.4 A	173.6 W 13.6 V 21.4 A	165.8 W 13.8 V 21.4 A	158.1 W 14.0 V 21.3 A	150.3 W 14.1 V 21.3 A	

In free air operations of the cold side water condenses at a relative humidity of: 80% 60% 40% 20% freezes

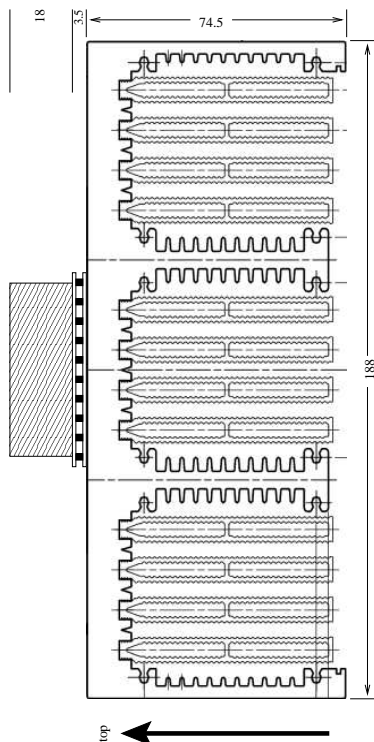
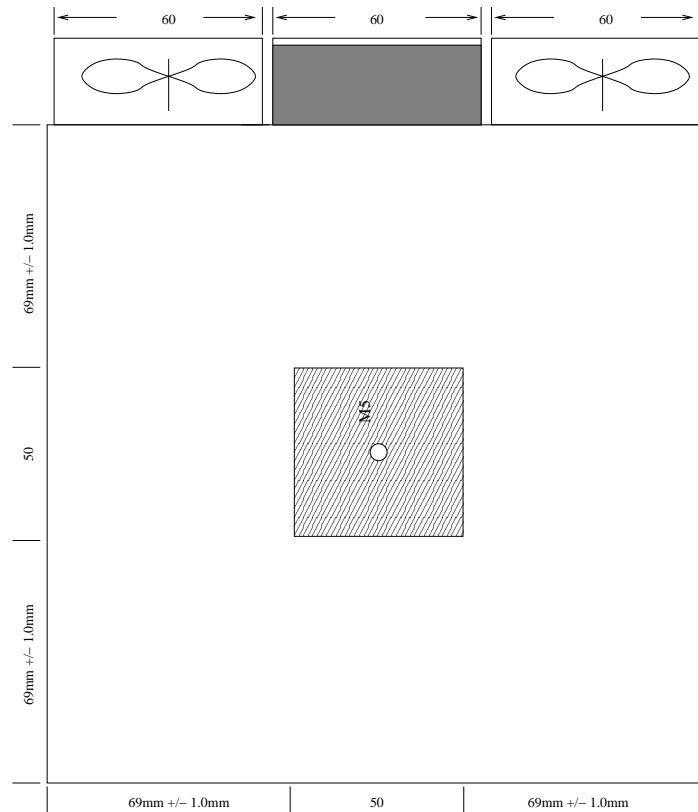
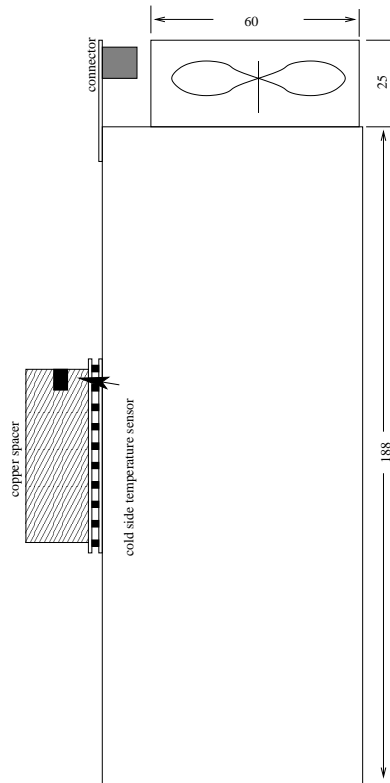
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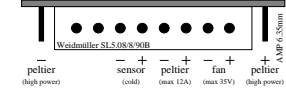
The thermal conductivity of the foam insulation material which is used in this system is about 30 mW/K · m.

The dynamical performance of the system is limited by the thermal capacity of the cold side which is 41.7 mW · h/K.

If water is condensed at the cold side the thermal capacity is increased by 1.16 mW · h/K · g of water.



General Technical Data:

mechanical dimensions:	mm
mechanical tolerances:	± 0.5 mm
electrical tolerances:	± 5 %
thermal tolerances:	± 3 %
(regarding to absolute temperatures [K])	
number of fans:	3
data of each fan:	60 mm axial 56 m ³ /h 12.0V @ 3.0W
(a 12V regulator is placed on the PCB of the connector)	
connector sheme:	
heatsink:	hollow fin profile ≤ 0.071 K/W
at 5 m/s air flow:	typ. 0.055 K/W
peltier element:	TEC1SE-55-55-280/78-BS
temperature sensor:	LM335 or PT100
please specify on order 0	
total mass:	3.8 kg

A cost reduced „light“ version without connector PCB and temperature sensor is available.

As on option are 30mm extension tubes between fan and heatsink available which cause a performance enhancement by up to 20% and less noise!

Ready-to-Use Thermoelectric Cooling System

maximum cooling power
 best operating voltage
 best operating current

} depending on ambient temperature and cooling temperature:

cooling temperature	ambient temperature (free air, 1013 hPa, 80% relative humidity)											
	10°C	15°C	20°C	25°C	30°C	35°C	40°C	45°C	50°C	55°C	60°C	
-40°C												
-35°C	7.5 W 12.3 V 16.8 A											
-30°C	18.5 W 12.4 V 17.1 A	10.6 W 12.6 V 17.1 A	2.7 W 12.8 V 17.1 A									
-25°C	29.6 W 12.4 V 17.5 A	21.7 W 12.6 V 17.4 A	13.8 W 12.8 V 17.4 A	5.9 W 13.0 V 17.4 A								
-20°C	40.7 W 12.5 V 17.8 A	32.8 W 12.7 V 17.8 A	24.9 W 12.9 V 17.8 A	17.1 W 13.1 V 17.8 A	9.2 W 13.3 V 17.7 A	1.3 W 13.5 V 17.7 A						
-15°C	51.9 W 12.5 V 18.2 A	44.0 W 12.7 V 18.2 A	36.2 W 12.9 V 18.1 A	28.3 W 13.1 V 18.1 A	20.4 W 13.3 V 18.1 A	12.5 W 13.5 V 18.1 A	4.6 W 13.7 V 18.1 A					
-10°C	63.2 W 12.5 V 18.5 A	55.3 W 12.7 V 18.5 A	47.4 W 12.9 V 18.5 A	39.5 W 13.1 V 18.5 A	31.6 W 13.3 V 18.4 A	23.8 W 13.5 V 18.4 A	15.9 W 13.7 V 18.4 A	8.0 W 13.9 V 18.4 A	0.1 W 14.1 V 18.4 A			
-5°C	74.5 W 12.6 V 18.9 A	66.6 W 12.8 V 18.9 A	58.8 W 13.0 V 18.8 A	50.9 W 13.2 V 18.8 A	43.0 W 13.4 V 18.8 A	35.1 W 13.6 V 18.8 A	27.2 W 13.8 V 18.8 A	19.3 W 14.0 V 18.7 A	11.4 W 14.2 V 18.7 A	3.5 W 14.4 V 18.7 A		
0°C	85.9 W 12.6 V 19.2 A	78.0 W 12.8 V 19.2 A	70.1 W 13.0 V 19.2 A	62.3 W 13.2 V 19.2 A	54.4 W 13.4 V 19.1 A	46.5 W 13.6 V 19.1 A	38.6 W 13.8 V 19.1 A	30.7 W 14.0 V 19.1 A	22.8 W 14.2 V 19.1 A	14.9 W 14.4 V 19.0 A	7.0 W 14.6 V 19.0 A	
5°C	97.4 W 12.7 V 19.6 A	89.5 W 12.9 V 19.6 A	81.6 W 13.1 V 19.5 A	73.7 W 13.3 V 19.5 A	65.8 W 13.5 V 19.5 A	57.9 W 13.7 V 19.5 A	50.0 W 13.9 V 19.4 A	42.1 W 14.1 V 19.4 A	34.2 W 14.3 V 19.4 A	26.3 W 14.5 V 19.4 A	18.4 W 14.7 V 19.4 A	
10°C	108.9 W 12.7 V 19.9 A	101.0 W 12.9 V 19.9 A	93.1 W 13.1 V 19.9 A	85.2 W 13.3 V 19.9 A	77.3 W 13.5 V 19.8 A	69.4 W 13.7 V 19.8 A	61.5 W 13.9 V 19.8 A	53.6 W 14.1 V 19.8 A	45.7 W 14.3 V 19.8 A	37.8 W 14.5 V 19.7 A	29.9 W 14.7 V 19.7 A	
15°C	120.5 W 12.8 V 20.3 A	112.6 W 13.0 V 20.2 A	104.7 W 13.2 V 20.2 A	96.8 W 13.4 V 20.2 A	88.9 W 13.6 V 20.2 A	81.0 W 13.8 V 20.2 A	73.1 W 14.0 V 20.1 A	65.2 W 14.2 V 20.1 A	57.3 W 14.4 V 20.1 A	49.4 W 14.6 V 20.1 A	41.5 W 14.8 V 20.1 A	
20°C	132.2 W 12.8 V 20.6 A	124.3 W 13.0 V 20.6 A	116.4 W 13.2 V 20.6 A	108.4 W 13.4 V 20.6 A	100.5 W 13.6 V 20.5 A	92.6 W 13.8 V 20.5 A	84.7 W 14.0 V 20.5 A	76.8 W 14.2 V 20.5 A	68.9 W 14.4 V 20.4 A	61.0 W 14.6 V 20.4 A	53.1 W 14.8 V 20.4 A	
25°C	143.9 W 12.9 V 21.0 A	136.0 W 13.1 V 20.9 A	128.1 W 13.3 V 20.9 A	120.2 W 13.5 V 20.9 A	112.2 W 13.7 V 20.9 A	104.3 W 13.9 V 20.9 A	96.4 W 14.1 V 20.8 A	88.5 W 14.3 V 20.8 A	80.6 W 14.5 V 20.8 A	72.7 W 14.7 V 20.8 A	64.8 W 14.9 V 20.8 A	
30°C	155.7 W 12.9 V 21.3 A	147.7 W 13.1 V 21.3 A	139.8 W 13.3 V 21.3 A	131.9 W 13.5 V 21.2 A	124.0 W 13.7 V 21.2 A	116.1 W 13.9 V 21.2 A	108.2 W 14.1 V 21.2 A	100.3 W 14.3 V 21.2 A	92.3 W 14.5 V 21.1 A	84.4 W 14.7 V 21.1 A	76.5 W 14.9 V 21.1 A	
35°C	167.5 W 12.9 V 21.7 A	159.6 W 13.1 V 21.6 A	151.7 W 13.3 V 21.6 A	143.7 W 13.5 V 21.6 A	135.8 W 13.7 V 21.6 A	127.9 W 14.0 V 21.5 A	120.0 W 14.2 V 21.5 A	112.1 W 14.4 V 21.5 A	104.1 W 14.6 V 21.5 A	96.2 W 14.8 V 21.5 A	88.3 W 15.0 V 21.4 A	
40°C	179.4 W 13.0 V 22.0 A	171.5 W 13.2 V 22.0 A	163.6 W 13.4 V 22.0 A	155.6 W 13.6 V 21.9 A	147.7 W 13.8 V 21.9 A	139.8 W 14.0 V 21.9 A	131.9 W 14.2 V 21.9 A	123.9 W 14.4 V 21.8 A	116.0 W 14.6 V 21.8 A	108.1 W 14.8 V 21.8 A	100.2 W 15.0 V 21.8 A	
45°C	191.4 W 13.0 V 22.3 A	183.4 W 13.2 V 22.3 A	175.5 W 13.4 V 22.3 A	167.6 W 13.6 V 22.3 A	159.7 W 13.8 V 22.3 A	151.7 W 14.0 V 22.2 A	143.8 W 14.2 V 22.2 A	135.9 W 14.4 V 22.2 A	127.9 W 14.6 V 22.2 A	120.0 W 14.8 V 22.1 A	112.1 W 15.0 V 22.1 A	
50°C	203.4 W 13.1 V 22.7 A	195.5 W 13.3 V 22.7 A	187.5 W 13.5 V 22.6 A	179.6 W 13.7 V 22.6 A	171.7 W 13.9 V 22.6 A	163.7 W 14.1 V 22.6 A	155.8 W 14.3 V 22.6 A	147.9 W 14.5 V 22.5 A	139.9 W 14.7 V 22.5 A	132.0 W 14.9 V 22.5 A	124.1 W 15.1 V 22.5 A	
55°C	215.5 W 13.1 V 23.0 A	207.5 W 13.3 V 23.0 A	199.6 W 13.5 V 23.0 A	191.7 W 13.7 V 23.0 A	183.7 W 13.9 V 22.9 A	175.8 W 14.1 V 22.9 A	167.9 W 14.3 V 22.9 A	159.9 W 14.5 V 22.9 A	152.0 W 14.7 V 22.8 A	144.0 W 14.9 V 22.8 A	136.1 W 15.1 V 22.8 A	
60°C	227.6 W 13.2 V 23.4 A	219.7 W 13.4 V 23.3 A	211.7 W 13.6 V 23.3 A	203.8 W 13.8 V 23.3 A	195.8 W 14.0 V 23.3 A	187.9 W 14.2 V 23.3 A	180.0 W 14.4 V 23.2 A	172.0 W 14.6 V 23.2 A	164.1 W 14.8 V 23.2 A	156.2 W 15.0 V 23.2 A	148.2 W 15.2 V 23.1 A	
65°C	239.8 W 13.2 V 23.7 A	231.9 W 13.4 V 23.7 A	223.9 W 13.6 V 23.7 A	216.0 W 13.8 V 23.6 A	208.0 W 14.0 V 23.6 A	200.1 W 14.2 V 23.6 A	192.1 W 14.4 V 23.6 A	184.2 W 14.6 V 23.5 A	176.3 W 14.8 V 23.5 A	168.4 W 15.0 V 23.5 A	160.4 W 15.2 V 23.5 A	
70°C	252.1 W 13.3 V 24.0 A	244.1 W 13.5 V 24.0 A	236.2 W 13.7 V 24.0 A	228.2 W 13.9 V 24.0 A	220.3 W 14.1 V 24.0 A	212.3 W 14.3 V 23.9 A	204.4 W 14.5 V 23.9 A	196.4 W 14.7 V 23.9 A	188.5 W 14.9 V 23.9 A	180.5 W 15.1 V 23.8 A	172.6 W 15.3 V 23.8 A	

In free air operations of the cold side water condenses at a relative humidity of: 80% 60% 40% 20% freezes

The cooling power of the system is decreased by 0.63 W for 1 g/h condensed water and additional by 0.11 W for 1 g/h frozen water.

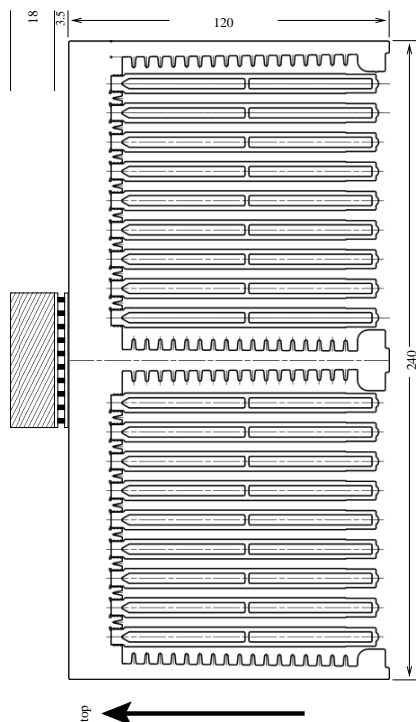
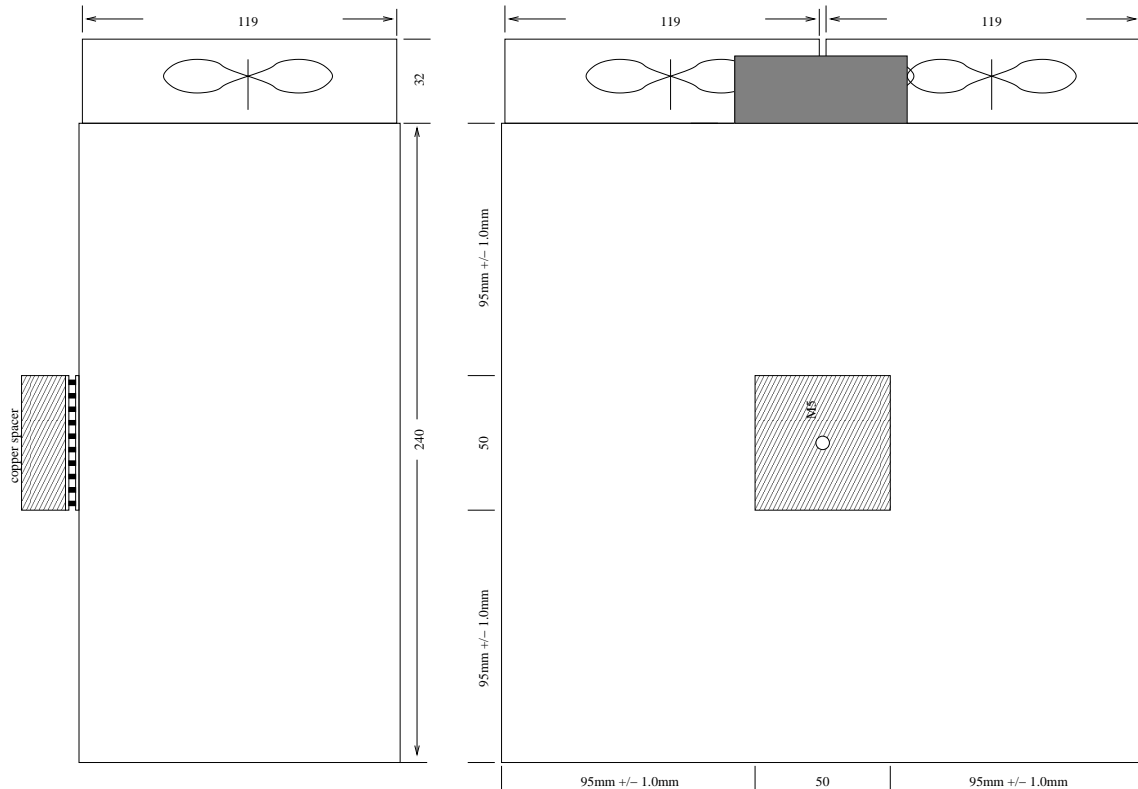
The cooling power of the system may also be decreased by air convection at the cold side and by heatflow through insulation materials.

The thermal conductivity of the foam insulation material which is used in this system is about 30 mW/K · m.

The dynamical performance of the system is limited by the thermal capacity of the cold side which is 41.7 mW · h/K.

If water is condensed at the cold side the thermal capacity is increased by 1.16 mW · h/K · g of water.

Ready-to-Use Thermoelectric Cooling System



General Technical Data:

mechanical dimensions:	mm
mechanical tolerances:	±0.5 mm
electrical tolerances:	±5 %
thermal tolerances:	±3 %
(regarding to absolute temperatures [K])	
number of fans:	2
data of each fan:	119 mm axial 198 m ³ /h 12.0 V @ 6.2 W
heatsink:	hollow fin profile ≤ 0.041 K/W
at 5 m/s air flow:	typ. 0.030 K/W
peltier element:	TEC1SE-55-55-280/78-BS
total mass:	9.8 kg

This aggregate has no connector PCB, voltage regulator and temperature sensor!
The cables of the fans and the TEC are directly accessible.