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TEA-1145

Hardware Version v2.30

The TEA-1145 is a ready-to-use thermoelectric cooling assembly intended for rapid evaluation and simplified thermal integration. Designed for simplicity, it integrates a Peltier element, an anodized cooling plate on the cold side, a heat sink with a 4-wire fan on the hot side, and two built-in NTC temperature sensors.

The TEA-1145 is an integral part of the Starter Kit SKT-1165. All values apply accordingly.

HIGHLIGHTS

- **Peltier Element Characteristics*:**
  - Heat pumping capacity (Q_{cmax}): 108 W
  - Temperature difference (ΔT_{max}): 78 °C
  - Voltage (U_{max}): 34.3 V
  - Current (I_{max}): 6 A
  - * see Electrical Characteristics for conditions
- Dimensions: 80 × 80 × 94 mm, Cable: 150 ± 15 mm
- Small, simple, and compact design
- Easy and quick system integration
- Integrated object- and sink-temperature sensors
- Integrated fan with protective cover
- Clear anodized cold plate
- REACH and RoHS compliant
- Part of the SKT-1165 Starter Kit.

Trial Device & Technical Support

Trial devices and technical support are available for evaluation projects.
Please contact support@meerstetter.ch or visit our support center.

RELATED PRODUCTS

Model	Type	Maximum Output	Description
TEC-1091	TEC Controller	±4 A / ±21 V	matching controller, single-channel
TEC-1161-4A	TEC Controller	2 × (±4 A / ±21 V)	matching controller, dual-channel
SKT-1165	Kit	±4 A / ±21 V	compact Starter Kit combining both the TEC-1091 and TEA-1145

See the full product overview in the Meerstetter Engineering's Product Compatibility section.

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1 SPECIFICATIONS

1.1 Absolute Maximum Ratings [1]

		Min	Max	Unit
Voltage	$U_{IN, DC}$		34.3	V
Current	I_{IN}		6	A

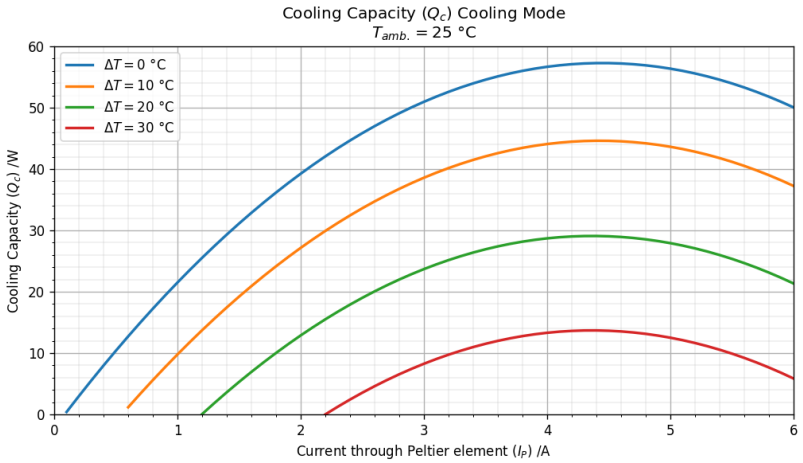
1 Operation at or beyond the absolute maximum ratings may result in permanent device damage. These limits are stress ratings only and functional operation of the device at these conditions is not guaranteed. Prolonged exposure to absolute maximum conditions can adversely affect long-term reliability and should be avoided during normal operation.

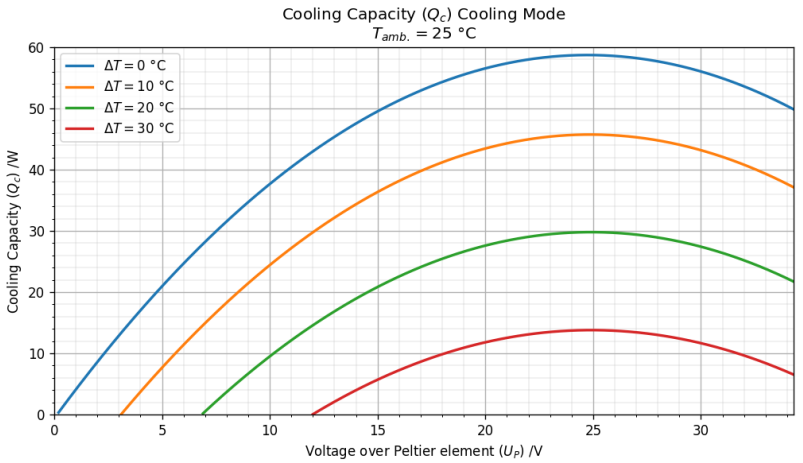
1.2 Operating Characteristics

		Min	Max	Unit
Temperature	T_{OP}	-10	80	°C
Humidity	RH_{OP}, non-condensing	5	95	%

1.3 Cooling Capacity

Unless otherwise noted: D_{Fan} = 100 % (max. Speed)





The temperature difference ΔT refers to the difference between the object temperature T_{obj} and the ambient temperature T_{amb}. Due to the fitting, the two graphs may show slight deviations.

1.4 Electrical Characteristics

Unless otherwise noted: T_A = 25 °C

Symbol	Parameter	Test Conditions / Hints	Min	Typ	Max	Unit
Peltier element (TE72001-241-060BS) from data sheet on our website:						
U	Supply voltage	Q_c = 0, I = I_{max}, T_h = 50 °C		24	34.3	V
I	Supply current	Q_c = 0, $\Delta T = \Delta T_{max}$, T_h = 50 °C		4	6	A
ΔT	Heat pumping capacity	Q_c = 0, I = I_{max}, T_h = 50 °C			78	°C
Q_c	Temperature difference	I = I_{max}, ΔT = 0, T_h = 50 °C			108	W
Fan (9GA0824P4J001) from data sheet on our website. Depending on the supplier, fan may vary:						
$U_{FAN\ DC}$	DC Fan Supply voltage		21.6	24	26.4	V
I_{100}	Supply current	D = 100 %		0.28		A
I_{25}	Supply current	D = 25 %		0.06		A
n_{100}	Speed	D = 100 %	6660	7400	8140	min^{-1}
n_{25}	Speed	D = 25 %	1960	2800	3640	min^{-1}
n_0	Speed	D = 0 %		0		min^{-1}
Object-temperature sensor (NTCLE305E4103SB) from data sheet on our website:						
$B_{25/85}$	$B_{25/85}$-value		3964.1	3984	4003.9	K
R_{25}	Resistance	T = 25 °C	9781	10k	10219	Ω
R_{-10}	Resistance	T = -10 °C	53506	55218	56930	Ω
R_{80}	Resistance	T = 80 °C	1231.4	1251.8	1272.2	Ω
Sink-temperature sensor (NTCALUG01A103F161) from data sheet on our website:						
$B_{25/85}$	$B_{25/85}$-value		3964.1	3984	4003.9	K

2 INTERFACE AND CONNECTORS

2.1 Peltier Connector Specifications X11

Used on the TEA assembly:

Description	Color	Female Crimp	Female Housing	Position
TEC (+)	Red	Molex 1053001100	Molex 1053071202	1
TEC (–)	Black			2

Matching receptacle (PCB connectors):

Description	Color	Male Crimp	Male Housing	Position
TEC (+)	–	–	Molex 1053131202	1
TEC (–)	–			2

2.2 Object-temperature sensor Connector Specifications X21

Used on the TEA assembly:

Description	Color	Female Crimp	Female Housing	Position
Object-NTC	Blue	Molex 08-50-0102	Molex 22-01-3027	1
	Blue			2

Matching receptacle (PCB connectors):

Description	Color	Male Crimp	Male Housing	Position
Object-NTC	–	–	Molex 0022053021	1
	–			2

2.3 Sink-temperature sensor Connector Specifications X22

Used on the TEA assembly:

Description	Color	Female Crimp	Female Housing	Position
Sink-NTC	Red	Molex 08-50-0102	Molex 22-01-3027	1
	Red			2

Matching receptacle (PCB connectors):

Description	Color	Male Crimp	Male Housing	Position
Sink-NTC	–	–	Molex 0022053021	1
	–			2

2.4 Fan Connector Specifications X31

Used on the TEA assembly:

Description	Color	Female Crimp	Female Housing	Position
FAN (–)	Black	Molex 08-50-0102	Molex 22-01-3047	1
FAN (+)	Red			2
FAN (Tacho)	Yellow			3
FAN (PWM)	Blue/Brown			4

Matching receptacle (PCB connectors):

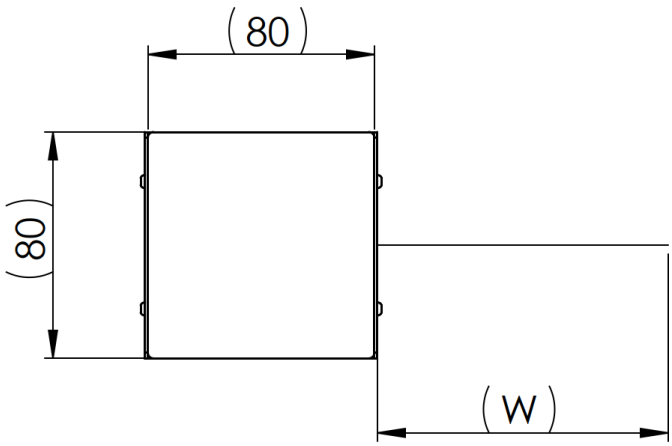
Description	Color	Male Crimp	Male Housing	Position
FAN (–)	–	–	Molex 470531000	1
FAN (+)	–			2
FAN (Tacho)	–			3
FAN (PWM)	–			4

3 MECHANICAL DATA

3.1 Dimensions

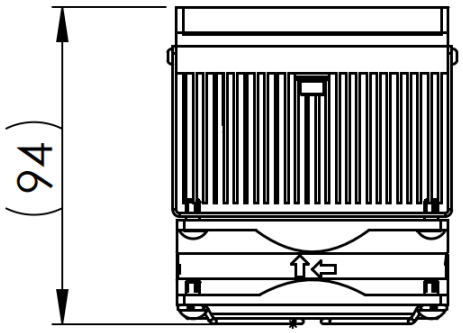
All dimensions in (mm)

Top View

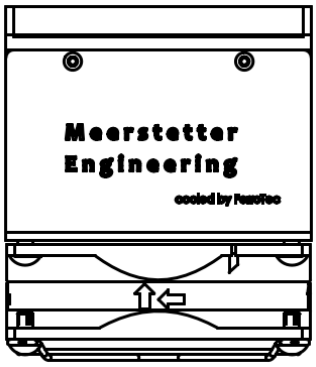


W = 150 mm ±15 mm

Side View



Front View



The 3D models and more detailed drawings of the cold plate and fan bracket are available on our website.

4 ALL MEERSTETTER ENGINEERING PRODUCTS

4.1 Meerstetter Engineering's Product Compatibility

The Laser Diode Drivers and TEC Controllers from Meerstetter have been developed to work along with each other. They share the same platform bus, communication protocol and hardware architecture. See the following table for an overview of the Laser Diode Drivers and TEC Controllers from Meerstetter Engineering:

Model		Output	Description
Laser Diode Drivers			
LDD-1321		0–1.5 A / 0–14 V	CW, Add-on TEC Controller available
LDD-1301		0–20 A / 0.5–45 V	1 ms – CW
LDD-1303		0–20 A / 1–120 V	1 ms – CW
LDD-1137		0–75 A / 0–70 V	1 ms – CW
LDD-1124		0–1.5 A / 0–15 V	CW, modulated modes
LDD-1121		0–15 A / 0–15 V	1 µs – CW, modulated, QCW and pulsed modes
LDD-1125		0–30 A / 0–27 V	1 µs – CW, modulated, QCW and pulsed modes
TEC Controllers			
Single-Channel Models	TEC-1092	±1.2 A / ±9.6 V	Micro
	TEC-1091	±4 A / ±21 V	Small
	TEC-1089	±10 A / ±21 V	Medium
	TEC-1162	±5 A / ±56 V	Medium-high
	TEC-1090	±16 A / ±30 V	Large
	TEC-1163	±25 A / ±56 V	Extra-large
Dual-Channel Models	TEC-1161-4A	2 x (±4 A / ±21 V)	Small
	TEC-1161-10A	2 x (±10 A / ±21 V)	Medium
	TEC-1122	2 x (±10 A / ±21 V)	Medium
	TEC-1166	2 x (±5 A / ±56 V)	Medium-high
	TEC-1123	2 x (±16 A / ±30 V)	Large
	TEC-1167	2 x (±25 A / ±56 V)	Extra-large

5 CHANGE HISTORY

Date of change	Version	Changed / Approved	HW Version
September 13, 2023	A	NZ / RK	v1.00
Change / Reason • Initial Creation			
December 13, 2023	B	LS / MR	v1.00
Change / Reason • Add: front page			
June 10, 2024	C	NZ / RK	v1.00
Change / Reason • Add: Curves for the cooling capacity			
April 29, 2026	D	NJ / SR/NZ	v2.30
Change / Reason • Mod: Datasheet design • Mod: Operating range corrected to -10 – 80 °C • Mod: Hardware Version is now v2.30			

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