

Fuses for Semiconductor Protection

CPV10 SERIES FUSES



- Fuses for Semiconductor Protection

IEC60269-6/UL248-19 standard

Size	Rated Voltage	Operating Class	Rated Breaking Capacity
10	1500Vdc	gPV	1500V@20kA

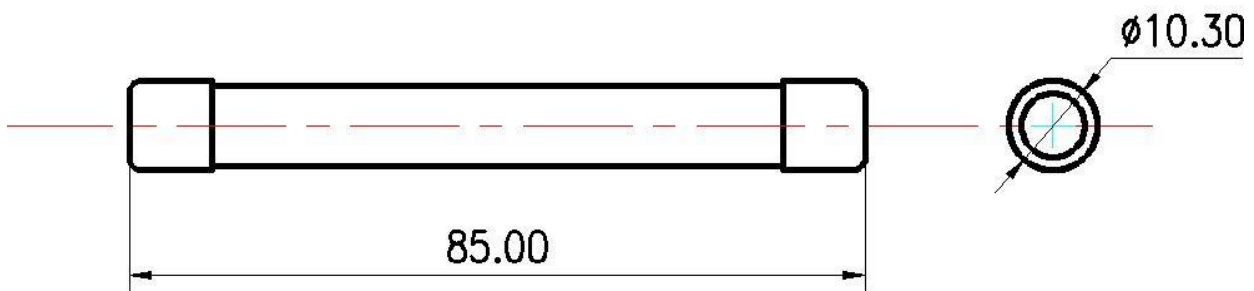
- Product Model

CPV10-XXA85B

● Description

- Excellent electric performance, quick protection for PV system, cut down the fault current of the system
- Product design conforms to IEC60269-6、UL248-19
- Product Process Conforms to ISO9001
- Product and Package conform to ROHS

● Dimensions

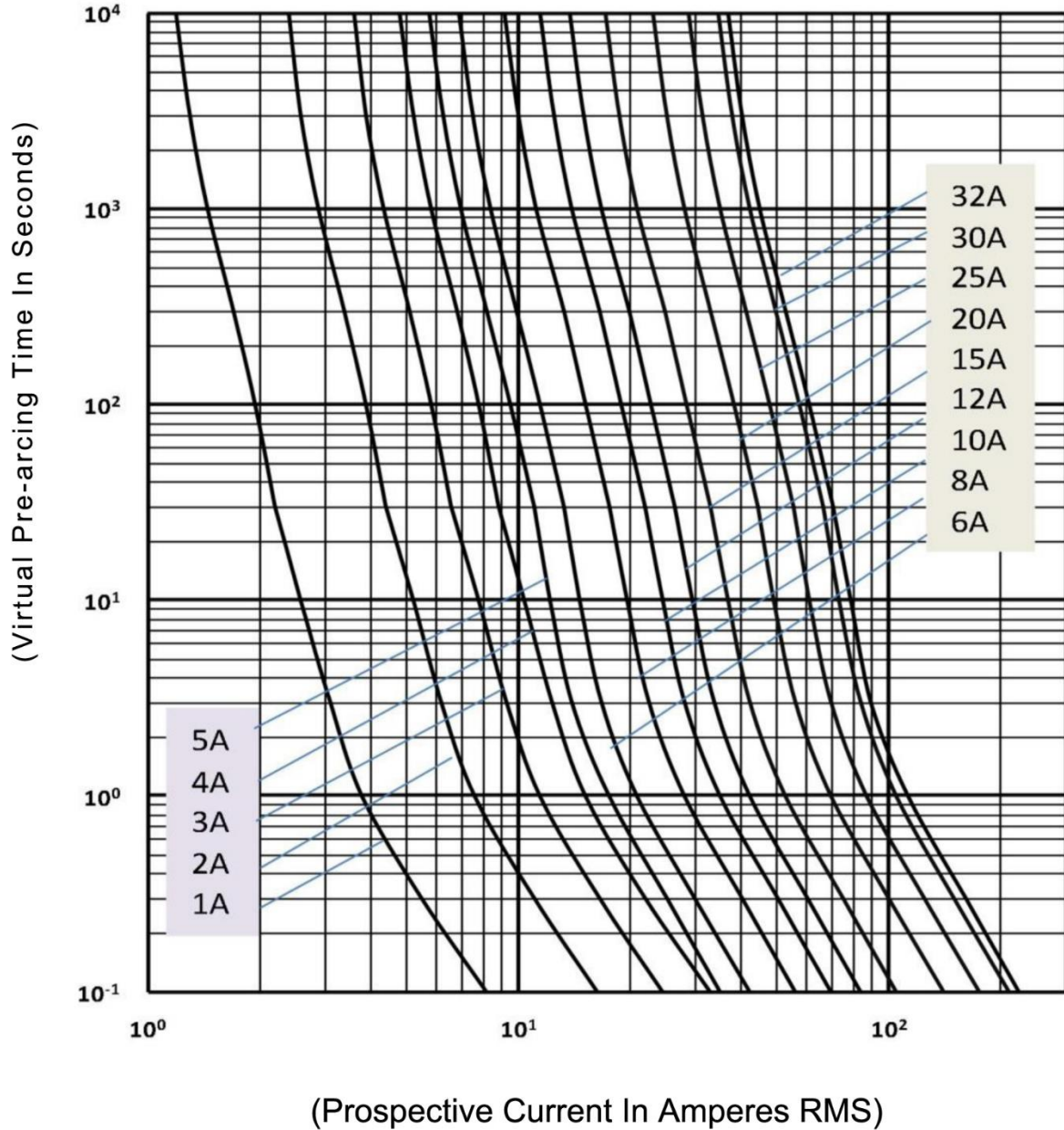


● Selection and ordering data

Rated current 【A】	Rated voltage 【V】	Part Number	Power Loss 【W】	Pre-arcing I _{2t} 【A ² S】	Total@1500V I _{2t} 【A ² S】	Weight 【Kg/1】	Pack
1	1500	CPV10-1A85B	1.5	0.6	1.5	0.013	12
2		CPV10-2A85B	1.8	1.6	5		
3		CPV10-3A85B	2	5	16		
4		CPV10-4A85B	2.3	12	33		
5		CPV10-5A85B	2.5	3	45		
6		CPV10-6A85B	3	5	50		
8		CPV10-8A85B	3.1	6	69		
10		CPV10-10A85B	2.35	11	120		
12		CPV10-12A85B	3.5	20	200		
15		CPV10-15A85B	4	32	360		
16		CPV10-16A85B	3.6	35	390		
20		CPV10-20A85B	4.5	50	670		
25		CPV10-25A85B	6	65	1050		
30		CPV10-30A85B	6.6	75	1300		
32		CPV10-32A85B	7.3	88	5300		

● Time- Current Characteristics Curve

CPV10-(1-32)A86B 1500VDC
(Time - Current Curve)



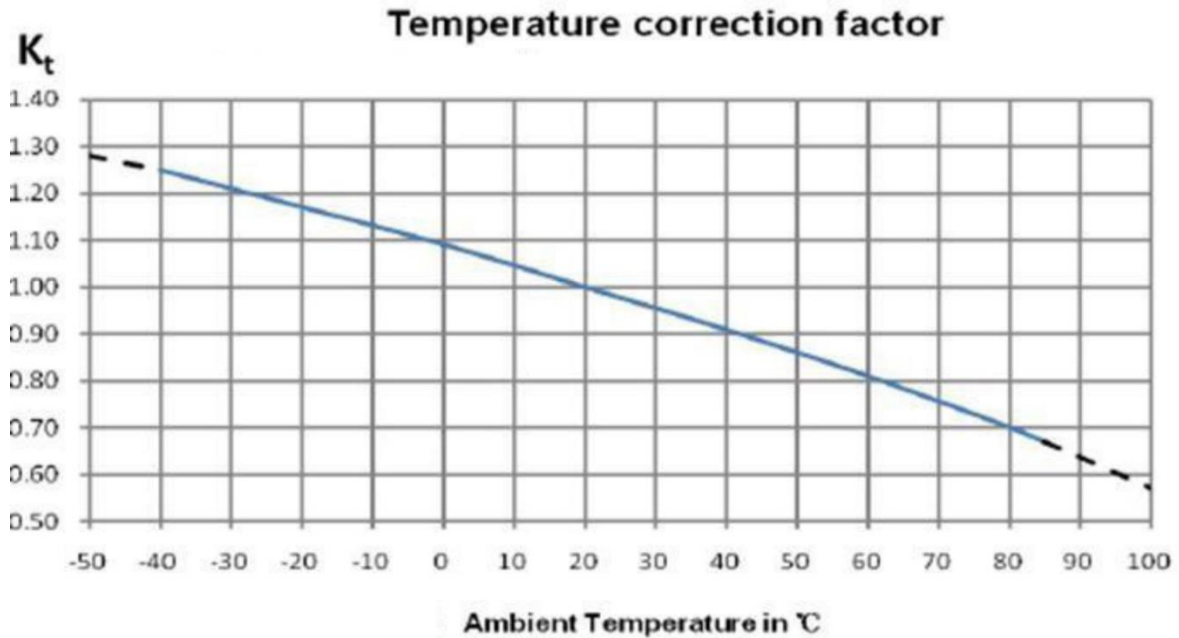
● Selection For The Fuse Amperage

Formula for rated amperage of the fuse

$$I_n \geq \frac{I_{RMS} \times G}{K_t \times K_e \times K_v \times K_f \times K_a \times K_b}$$

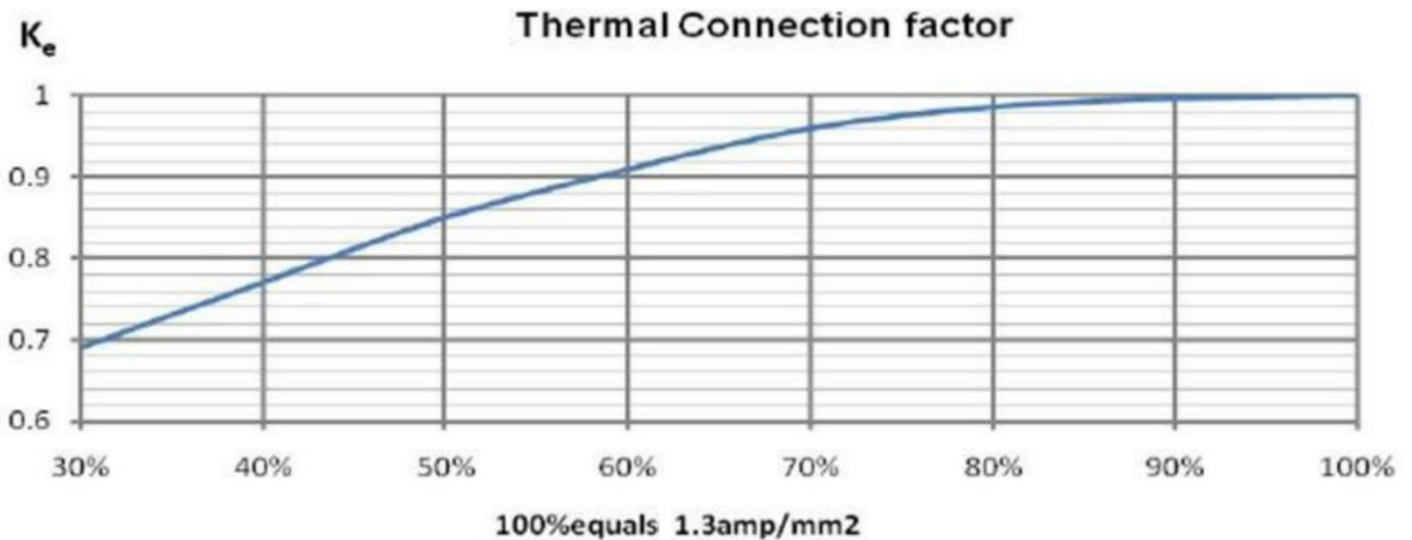
- Temperature Correction Factor K_t

Fuses under different ambient temperatures will affect the thermal radiation effect of the fuse's heat. The correction factor K_t values for different ambient temperatures are shown in the following curves:



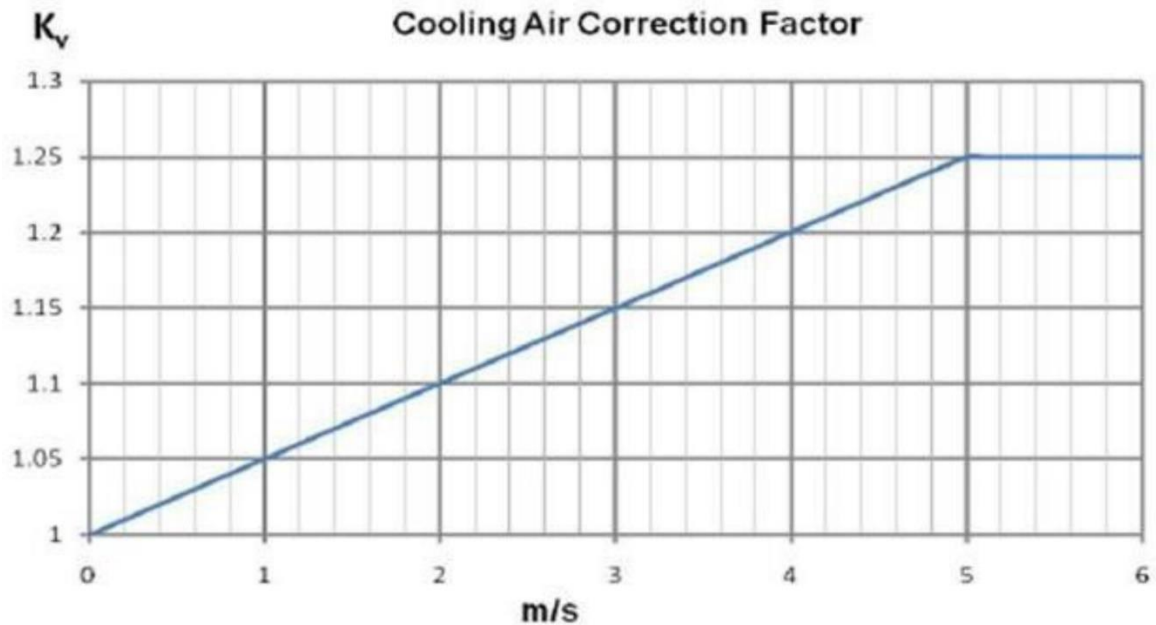
- Thermal Connection Correction Factor K_e

When fuses are installed, the specifications of the copper bars or wires (wire harnesses) directly connected to the fuses will affect the heat conduction effect of the fuses. For different connection copper bars (or wires) selected, the thermal connection correction factor K_e value is shown in the following curve:



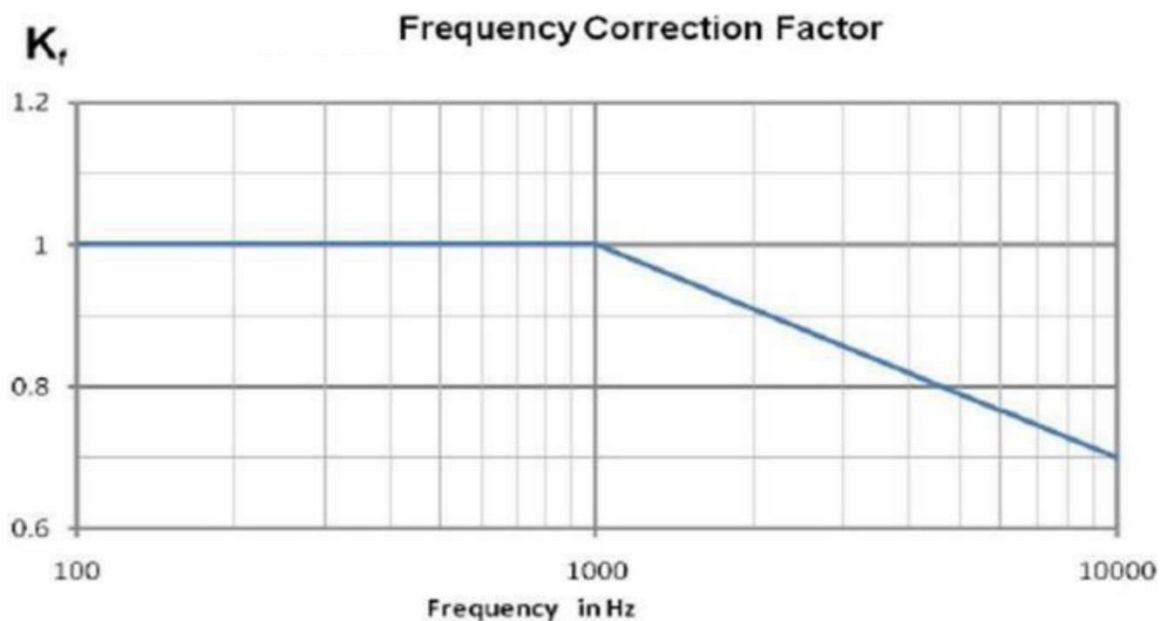
- **Forced Cooling Correction Factor K_v**

For fuses, forcibly increasing air cooling (or liquid cooling) will enhance the thermal convection effect of the fuse's heat, which can increase the fuse's flow rate. The forced cooling correction factor K_v value is shown in the following curve:



- **Frequency Correction Factor K_f**

When there are high-frequency harmonics in the power grid and the frequency reaches above 1000Hz, due to the influence of high-frequency distortion on the resistance, the capacity of the fuse needs to be reduced. The coefficients are as follows:



● Altitude Correction Factor K_a

- The normal operating altitude for the fuse is 2000 meters. When the altitude increases, the air becomes thinner, which adversely affects the occurrence of thermal radiation. The impact on heat dissipation can be considered as a derating of 3% to 5% for every 1000 meters of elevation. At the same time, due to geographical conditions, the ambient temperature typically decreases by approximately 6°C for every 1000-meter increase in altitude. To avoid double-counting with the temperature correction factor (K_e), this effect can be considered as offsetting.
- For the fuse used in enclosed environments, if the ambient air temperature inside the sealed enclosure does not significantly decrease with increasing altitude, and can still reach above 40°C, then derating the rated current is required. The rated current should be derated by 3% to 5% for every 1000 meters increase in altitude.
- Regarding the impact of high altitude on insulation strength, since the fuse itself is a conductor during normal operation, only the insulation level of the live parts of the fuse relative to the casing (ground) needs to be considered. Therefore, the impact of high altitude on this aspect can be integrated as part of the overall system's electrical components and does not need to be treated separately for the fuse.

● Installation Environment Correction Factor K_b

Fuses installed in open-type enclosures: $G = 1$

Fuses installed in sealed enclosures: $G = 0.9-0.95$

Fuses installed in MSD with bolt fastening: $G = 0.8$

Fuses installed in MSD with plug-in connection: $G = 0.7$

● Load Constant G

Different types of load conditions can generate varying levels of inrush current, and the following considerations need to be taken into account:

Principle:

Purely resistive load, no inrush current,

$G = 1$. Resistive load with peak current:

$G = 1.1-1.2$

Highly capacitive load with high peak inrush current: $G = 1.5-1.7$

● Operating Condition

No	Item	Requirements
1	Operating Voltage	$\leq 1500\text{Vdc}$
2	Operating Environment	
	Normal Applied Temperatures	$-5^{\circ}\text{C} \sim 40^{\circ}\text{C}$
	Allowed Operation Temperature	$-40^{\circ}\text{C} \sim 125^{\circ}\text{C}$
	Relative Humidity	$5\% \sim 95\%$
3	Altitude	
	Normal Altitude Location	$\leq 3000\text{m}$
	Allowed Mounted Altitude	$\leq 5500\text{m}$
	Atmospheric Pressure	$61.6\text{kPa} \sim 106.2\text{kPa}$
4	Storage Environment	
	Normal Storage Condition	$-5^{\circ}\text{C} \sim 85^{\circ}\text{C}$ RH < 75%
	Allowed Storage Condition	$-40^{\circ}\text{C} \sim 120^{\circ}\text{C}$
5	Install Torque	/
6	Pollution level	III
Note:	If exceeding the normal usage conditions, some parameters may need to be corrected within the allowed usage conditions, please contact with Component Basics.	

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Mailing Address: Component Basics, 1539, 35-Viking Lane, Toronto, M9B 0A2, ON, Canada.

Email: info@componentbasics.com