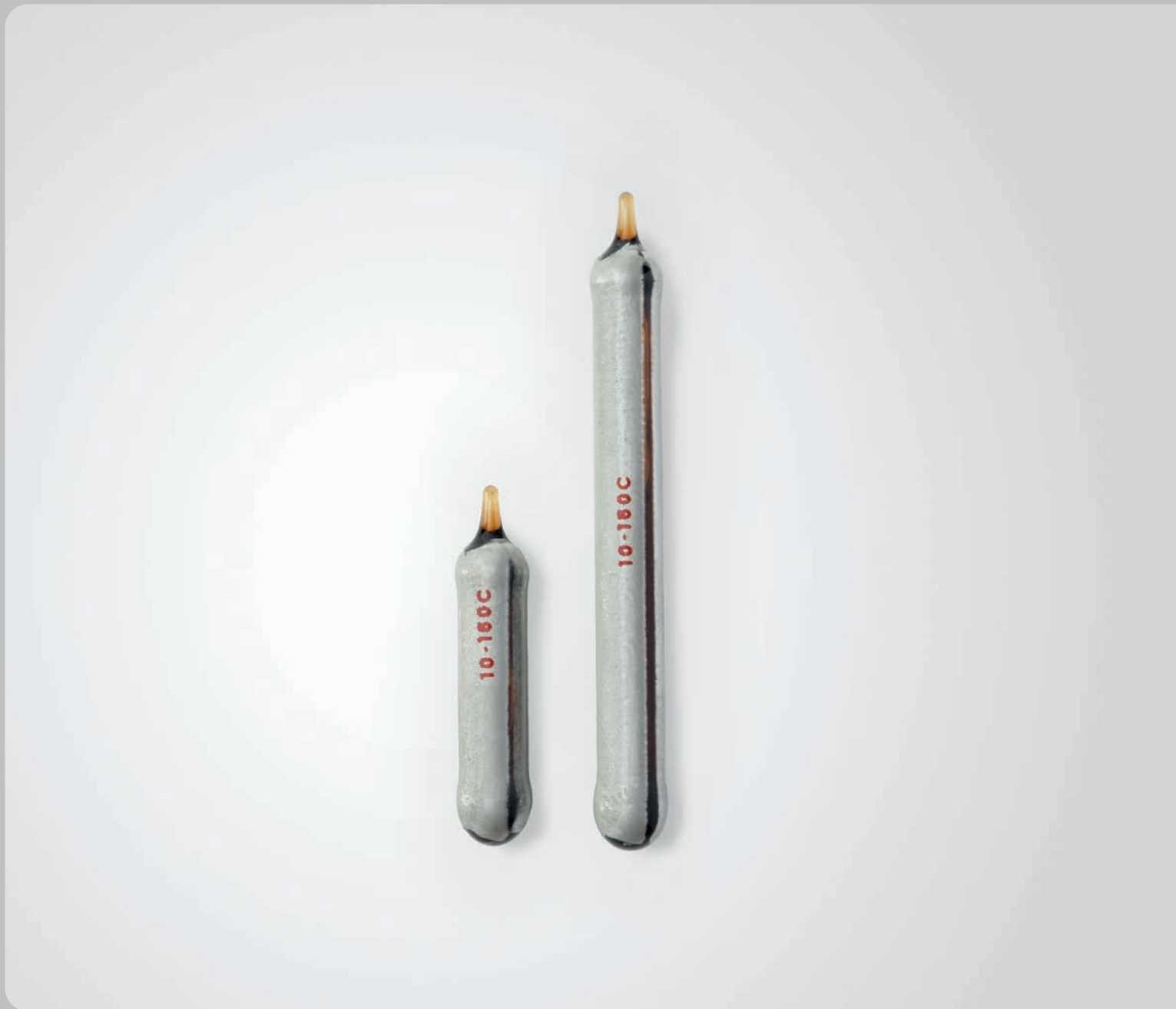


# PERMALUX



## E-BULB EXTINGUISHING BULB

Your partner on land, on water, in the air



# E-BULB EXTINGUISHING BULB

## THE CHALLENGE

At home, as well as in the industry, there are countless technical devices and appliances to support our modern daily life. Most of this equipment are electronic products of some sort. It can be computers, dishwashers or dryers, entertainment and lighting equipment, switchboards or smart home devices. In the industry, computer hardware, electronic equipment, electric cabinets and PCB boards can be found pretty much everywhere.

While having all these products makes life more comfortable, they also pose an increased danger of electrical faults, or even fires. Globally, more than 30% of all fires are caused by electric or electronic equipment or installations. With the inherent risk of fire from electric devices, danger for life and loss of property or equipment values increases with the number of such devices around us. Following the vision "A world where everyone is protected against the dangers

of fire, everywhere and anytime", PERMALUX has developed solutions to detect and extinguish electric fires when they are still small and in an early stage. With the internationally protected E-Bulb, PERMALUX has designed a reliable system that detects heat inside an electric device (e.g. from fire), extinguishes the fire and – most importantly – prevents a fire from re-igniting by interrupting the electric power supply.

## THE SOLUTION

For protection of life and property, thermally activated glass bulbs are billion-fold successfully used in the global sprinkler industry. The glass bulb breaks at a defined temperature; the sprinkler opens and releases water onto the fire to effectively extinguish. The PERMALUX E-Bulb is the next evolutionary product development step, building upon the proven technology of P.E.R.'s outstanding quality sprinkler bulbs.

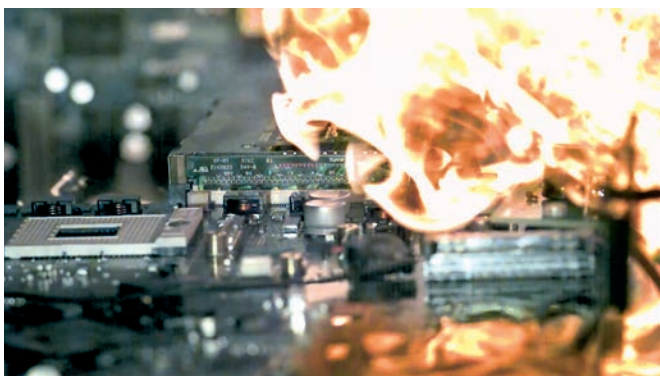


## THE FUNCTION

PERMALUX' E-Bulb is filled with 3M™ Novec™ Engineered Fluid. This non-toxic, non-conductive extinguishing liquid is released into the device when the defined temperature is reached and the Thermo-Bulb bursts. After being initiated, the E-Bulb extinguishes the fire, and interrupts the electric current. Transition-free, the liquid immediately

converts into gas. As a result of cooling and (partly) by oxygen reduction, a fire on a PCB will be extinguished within seconds.

And, because the current flow over the E-Bulb is interrupted, the electric fire cannot re-ignite!

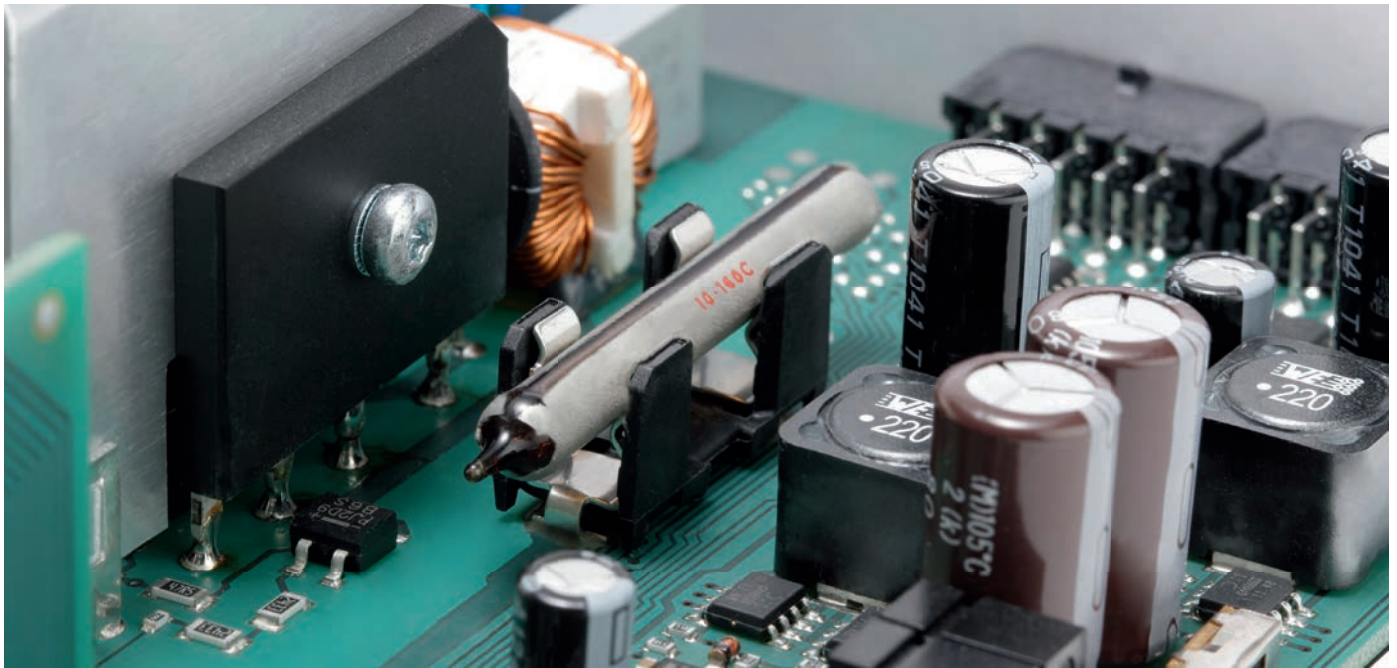


Fire starts due to electronic failure.



The E-Bulb automatically detects and extinguishes the fire.

# E-BULB EXTINGUISHING BULB



## THE ADVANTAGES AT A GLANCE

- Thermo Bulbs are billion-fold proved safety products
- Easy to install
- Operating temperatures (ambient, triggering) can be customized
- Maintenance free
- Novec™ 3M™ poses no health hazard
- Retrofittable into existing designs
- Non-corrosive extinguishing agent
- Zero ODP / non-ozone hazard
- Non-reactive with other materials
- Can be used as a passive fire detection and extinguishing device (no power interruption)
- Non-conductive extinguishing agent
- Reduces alternative fault-protection needs on PCBs

## APPROVALS AND REFERENCES

- Effectiveness verification by MPA Institute Dresden
- Effectiveness verified by UL
- VDE information testing successfully accomplished
- UL listed \*\*

## SPECIFICATIONS

	Dimensions (standard)*		
	Ø 5 x 20 mm	Ø 5 x 40 mm	Ø 7 x 40 mm
Sensitivity [s] <sup>1</sup>	48	48	48
Gasvolume V <sub>Gas</sub> [ml]	16,6	42,0	88,5
Protected Volume V <sub>4%</sub> [ml] <sup>2</sup>	416	1,049	2,212
Protected Volume V <sub>4%</sub> [fl oz] <sup>2</sup>	14	35 ½	75

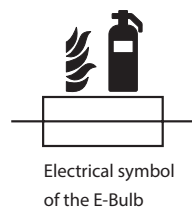
E-Bulb is available in a variety of electrical specifications

Currents	Class 1: <1A	Class 2: <5A	Class 3: <10A	Class 4: < 16A**
Voltages:	0..250V AC/DC	0..250V AC/DC	0..250V AC/DC	0..250V AC/DC

<sup>1</sup> Tested in the wind tunnel at 2,54 m/s and 135°C air temperature

<sup>2</sup> In accordance with NFPA 2001 "Clean Agent Extinguishing Systems"

\* other sizes and volumes are available \*\* available soon







ISO 9001  
BUREAU VERITAS  
Certification



EN 9100  
BUREAU VERITAS  
Certification



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