

# Electric High-Voltage Heaters (HVH)

- Innovative Heat Layer Technology
- Highest efficiency through quick and direct heat transfer
- Seamless and exact controllability between 0.2 and 10kW
- No inrush current or power peaks
- No lead or rare earth materials
- Utilizes recuperation and balances the vehicle HV-system
- Ready for Boost operation
- Safety in Software, Hardware and Mechanical Design



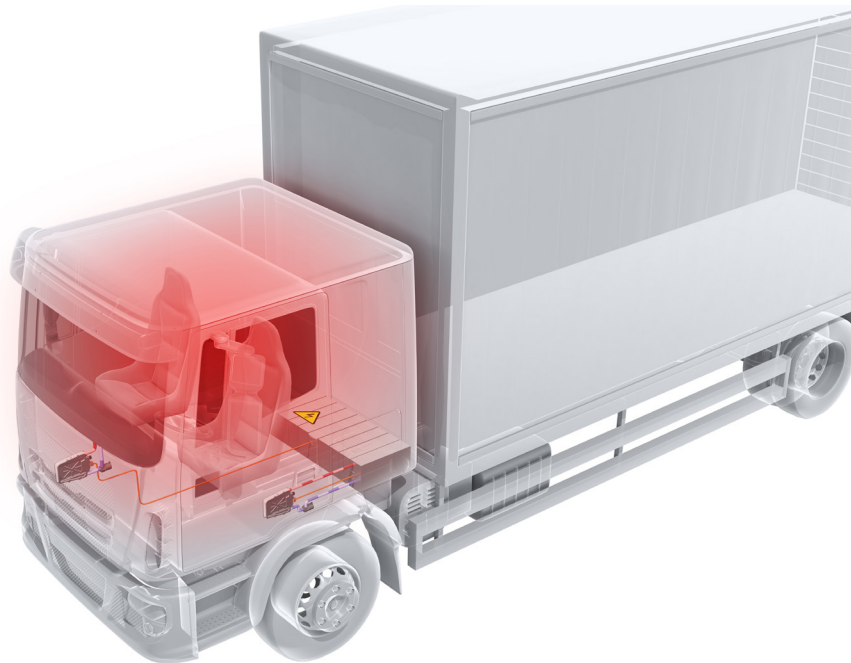
The innovative coolant heater for hybrid and electric vehicles in the commercial vehicle as well as passenger car segment.



Technical specifications:

	HVH 50/70	HVH 100
Heating capacity (kW) at $T_{med} = 70^{\circ}\text{C}$ , 500 l/h	up to 5/7 kW ( $T_{medium} = 70^{\circ}\text{C}$ ; 500 l/h)	up to 10 kW ( $T_{medium} = 40^{\circ}\text{C}$ ; 500 l/h)
Controllability (W)	50 W steps	50 W steps
Range of supply voltage (V DC)	100 V - 490 V	250 V - 870 V
Efficiency	> 95 %	> 95 %
Dimensions (mm)	284 x 200 x 54	325 x 200 x 72
Weight	1,950 g	2,600 g
Temperature range during heat mode ( $^{\circ}\text{C}$ )	-40 $^{\circ}\text{C}$ to 90 $^{\circ}\text{C}$	-40 to +90
Coolant- and ambient temperature ( $^{\circ}\text{C}$ )	-40 to +125	-40 to +125
BUS system integration	LIN 2.1/PWM	LIN 2.0
IP type of protection	IP 6K9K IP6K7	IP 6K9K IP6K7
Lifetime (years)	15	15
Heating time (h)	12,000	12,000
Functional safety	according ISO26262	according ISO26262

\* $T_{med}$  = Cooling medium temperature



Winner in the category  
"Drive Systems, System Electrics,  
Test Systems", 10/2013