

eBTM 2.0

Battery Thermal Management

PLUG & PLAY

COMPACT
& POWERFUL

STAND ALONE



**Universal plug & play thermo management solution
for traction battery packs**

Ensures ideal battery performance and prolongs service life

Traction batteries will only function perfectly in narrow temperature ranges:

Battery cells do not deliver the desired output when cold and may degrade over time when too hot. eBTM 2.0 monitors the current temperature and actively balances between cooling and heating circuits, thus always hitting the “sweet spot”.

Stand-alone battery thermo management unit



Cooling

Provides optimal cooling when battery packs are under stress or used during hot weather conditions



Pre-Conditioning

Sets the perfect temperature for battery cells during charging phases or before operation



Heating

Delivers heat during extremely cold ambient conditions



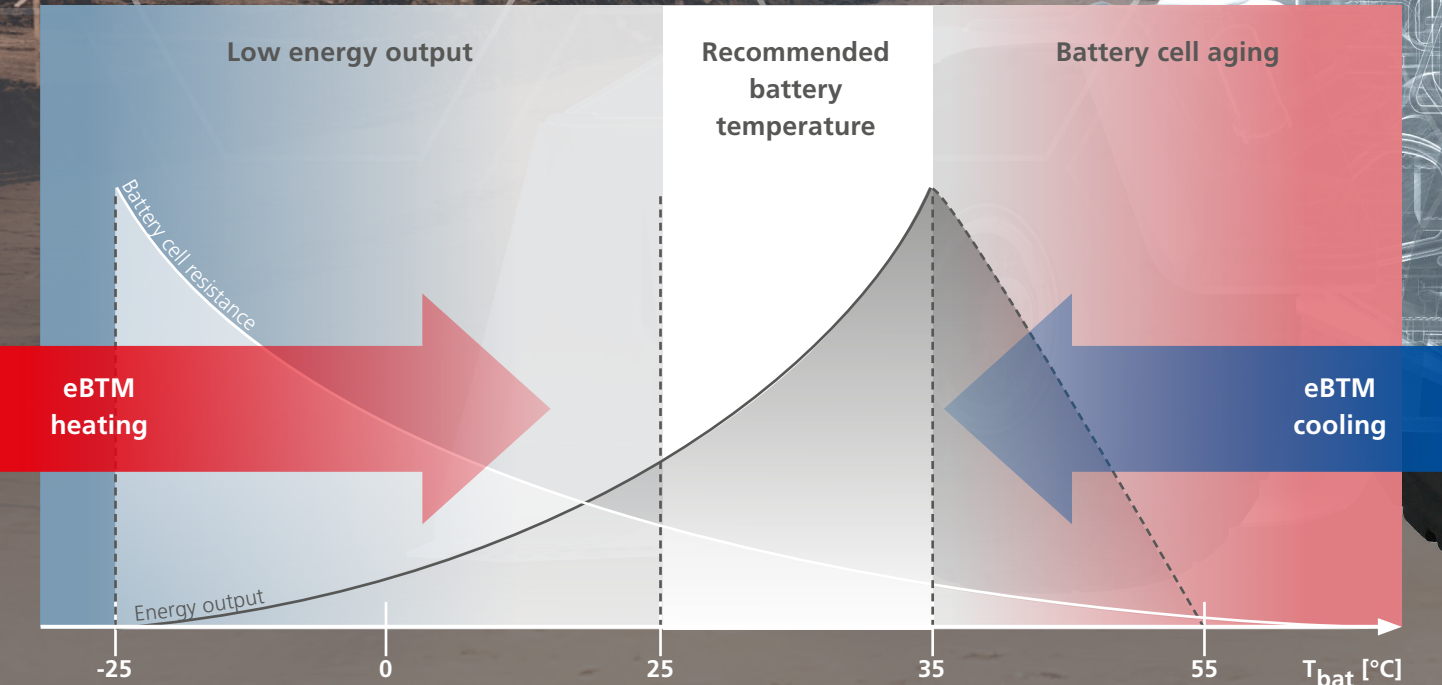
Balancing

Adjusts the temperature dynamically during different driving phases



6x battery packs


Entirely scalable system




Versatile and suitable for every application

eBTM 2.0 is a precisely tuned system solution for light commercial vehicles, busses, trucks, construction and agricultural vehicles. It is also a perfectly scalable solution: Starting with just one unit, every type of electrical vehicle can be equipped with one or several battery cooling units.


Advantages




Up to
+24%
higher recuperation and charging
power in low temperatures²




Up to
+41%
charging energy within 1h with
active thermal management¹



Up to
+21%
Battery State of Health in
hot Climate Conditions⁴



Up to
2x
faster charging
with pre-conditioned battery packs³



Up to
+8.9%
more driving range with high
frequency start/stop driving profile⁵

Compliant with automotive and off-highway standards

CE Conformity

2014/35/EU
2006/42/EU
2006/42/EG (off-highway)
2014/30/EU EMV
(off-highway)

ECE R10

Homologation
2014/30/EU

ISO 26262

ASIL Level C
compliant

ISO 6469-3

Electrical tests

ISO 19453-4

Storage test
24h @ - 40°C
48h @ + 70°C

ISO 19453-4

Operating test
24h @ - 35°C
96h @ + 50°C

ISO 12405-2

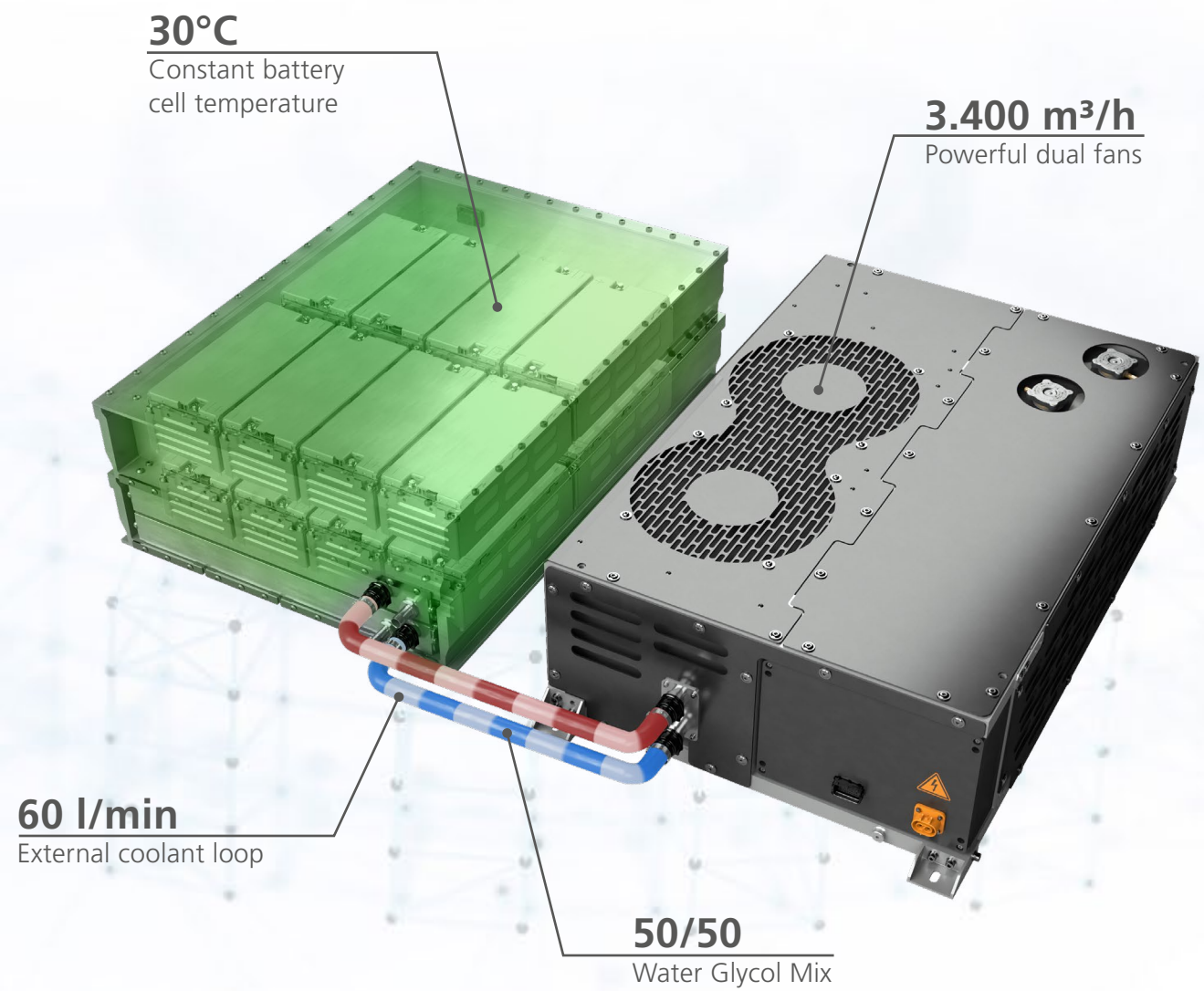
Shock and vibration

IEC 60068-2-52

Corrosion test
336h

Plug & play installation

For the customer's convenience, there are only a few standardized connection interfaces, which allow quick and easy installation and commissioning.



Compact but powerful

Components for coolant & heating circuits, electrical water pumps and control units are already included in eBTM's compact housing.

Variety of installation positions

A compact design and several fixture points ensure flexible installation. This way, the unit can be mounted in any position: e.g., on bus roofs or under the chassis of trucks or LCVs.



Scan for detailed
technical animation

¹ Performance measured under simulated conditions on a cold day in Stockholm with 80 kW fast charging power
² Performance measured under simulated conditions on a cold day in Stockholm
³ Measured under simulated conditions on cold day in Stockholm, from 20% to 80% CSoC
⁴ Performance measured under simulated conditions in Dubai @ +35°C amb
⁵ Performance measured under simulated conditions on a cold day in Stockholm

Technical specifications

eBTM 2.0 400 VDC

eBTM 2.0 800 VDC

Functional information		
Maximum cooling power	8 kW	8 kW
Maximum heating power	7 kW	10 kW
Maximum coolant flow	60 l/min	60 l/min
Nominal coolant flow	52 l/min	54 l/min
Pressure level outlet eBTM	0.5 barA	0.5 barA
Ambient temperature range	- 35 ... 50°C	- 35 ... 50°C
Electronical information		
High voltage		
Nominal high voltage supply	366 VDC	675 VDC
High voltage operating range	300 VDC - 432 VDC	500 VDC - 850 VDC
High voltage undervoltage limit	200 VDC	450 VDC
High voltage overvoltage limit	450 VDC	865 VDC
Maximum heating power consumption	7.5 kW	10.5 kW
Maximum cooling power consumption	6 kW	6 kW
Min Isolation Resistance (@ 1000 VDC)	500 kΩ	500 kΩ
Max discharge time (HV < 60 VDC)	3s (@ 432 VDC)	45s (@ 850 VDC)
Max Voltage withstand	1900 VAC for 60s	1900 VAC for 60s
Maximum voltage rise	40 V/ms	100 V/ms
Cx - Capacity	55 µF	67 µF
Cy - Capacity	70 nF	70 nF
High voltage connector (eBTM)	Amphenol ELR2A02	Amphenol ELR2Y02
High voltage connector (Counterpart)	Amphenol ELP2A02	Amphenol ELP2Y02
Communication / Low voltage		
Communication with VIB	CAN BUS 2.0B / CAN J1939	CAN BUS 2.0B / CAN J1939
Baudrate	250 kbps / 500 kbps	250 kbps / 500 kbps
Low Voltage power in operating modes	50 W	50 W
Nominal low voltage range	12 VDC : 9 VDC - 16 VDC	12 VDC : 9 VDC - 16 VDC
	24 VDC : 18 VDC - 32 VDC	24 VDC : 18 VDC - 32 VDC
Max. low voltage power in sleep mode	0.6 W (50 mA @ 12 VDC)	0.6 W (50 mA @ 12 VDC)
	0.24W (10 mA @ 24 VDC)	0.24W (10 mA @ 24 VDC)
Communication connector (eBTM)	FCI HCCMHPE24BKAFSV	FCI HCCMHPE24BKAFSV
Communication connector (Counterpart)	FCI 211PC249S0053	FCI 211PC249S0053
General Information		
Dimensions L x W x H	1000 mm x 700mm x 300mm	
Compressor	Scroll	
Protection IP degree	IP66	
Weight	91 kg	
Installation position	Roof / Chassis	
Refrigerant	R-1234yf	
Refrigerant charge	500 g	
Battery fluid	Water/Ethylene Glycol mix at 50-50%	
Storage temperature range [°C]	- 40 ... 70°C	
Internal coolant circuit	3 l	
External coolant circuit (eBTM share of liquid)	3.4 l + 0.75 l	
Hydraulic connector (eBTM)	NORMAQUICK PS3 NW20	NORMAQUICK PS3 NW20
Low voltage power supply needed	Internal DC/DC installed	

