

# BATTERY THERMAL MANAGEMENT SYSTEMS (BTMS)

## GRAYSON THERMAL SYSTEMS BTMS RANGE



**Optimises battery**



**Plug & play**



**Adapts**



**Production**



**Specialists in**

the transportation industry



**Designed**

with Grayson's extensive know-how & expertise



**Service**

exceptional service and product support



**Guaranteed**



**Lightweight**



## PART NUMBERS:

**3A-6720-0A00** - Active and Passive Cooling & Heating

**3A-6720-0B00** - Active and Passive Cooling Only

**3A-6720-0C00** - Active Cooling & Heating

**3A-6720-0D00** - Active Cooling Only

**800V DC capability available. Enquire today for more information.**

## SYSTEM OVERVIEW

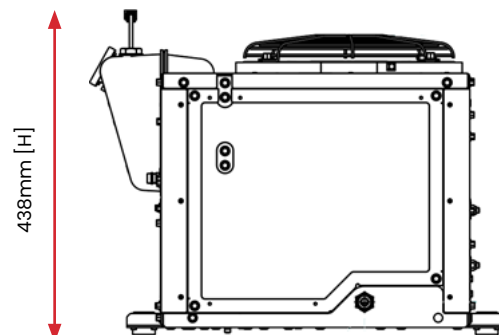
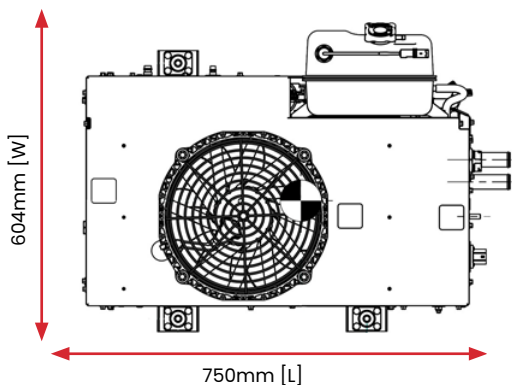
Providing precise thermal regulation for high-capacity, temperature-sensitive batteries, the BTMS GEN3 Compact is the ideal single unit battery thermal management solution for installations where space is at a premium.

Capable of providing battery heating and cooling in even the most extreme of climates, the BTMS GEN3 Compact includes the same controls and integration as the GEN3 Standard while its smaller footprint provides more packaging flexibility.

## KEY FEATURES:

- Configurable with the options of active cooling, passive cooling and/or heating
- Suitable for roof mounting or chassis / body mounting
- Integrated water pump
- CAN J1939 "plug and play" control
- CAN boot loader for easy software updates
- DMI diagnostics messages on CAN network
- Fuseless smart power distribution on LV circuits
- Electric expansion valve
- Pressure transducers for fan speed regulation
- Brushless fan
- Lightweight header tank
- 24VDC for controller, fans and pump
- 600V DC nominal, 750V DC max (860V DC max option available)

## DIMENSIONS



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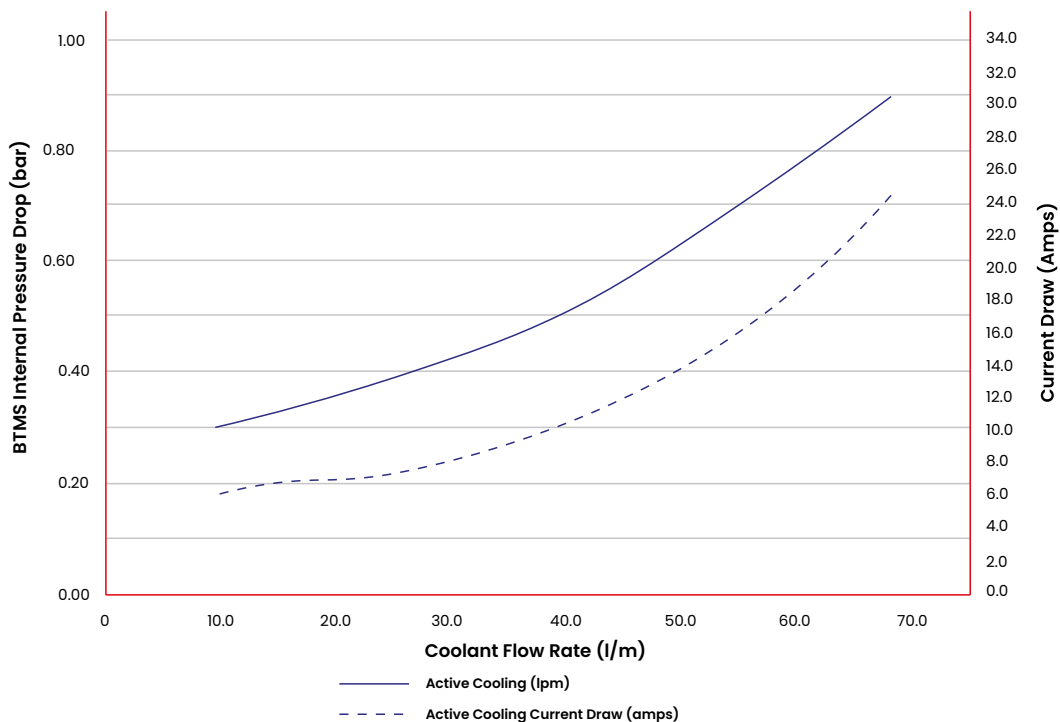
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## GEN3 COMPACT

	40°C	50°C
Maximum cooling capacity (kW) at: outside temperature (°C) of coolant outlet (°C) of coolant flow (l/m)	5.8 40 25 40	4.4 50 25 40
Water heating capacity	3.6kW (5kW Optional)	
Operating voltage	600V DC / 24V DC	
24V DC Maximum power consumption (pump / fan)	18 + 24A	
600VDC Maximum power consumption (compressor / heater)	6.25A	
Maximum weight (without coolant) (kg) (0AXX variant - active and passive cooling and heating)	55kg	
Dimensions L x W x H (mm)	750mm (L) x 450mm (H) x 483mm (W)	
Refrigerant type Charge weight (kg)	R134a/ 407C Opional 0.9	
Connector types (High voltage (4-Pin)) 24V DC & Control Protocol via CAN J1939	TE Connectivity - HVA280 Deutsch HDP24/26	
Integrated header tank	Yes	
Outlet size O.D. (mm)	Ø 28.75 mm	
Anti-vibration mounts	Included	
Fan technology	Brushless motor	
Integrated water pump	Yes (brushless motor)	
Option for remote water heater	Yes – up to 35kW	

Active Cooling Circuit Internal Pressure Drop



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## PART NUMBERS:

**3A-6725-0A00** - Active and Passive Cooling & Heating

**3A-6725-0B00** - Active and Passive Cooling Only

**3A-6725-0C00** - Active Cooling & Heating

**3A-6725-0D00** - Active Cooling Only

**800V DC capability available. Enquire today for more information.**

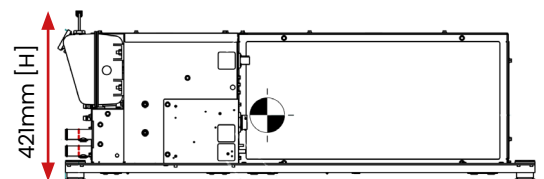
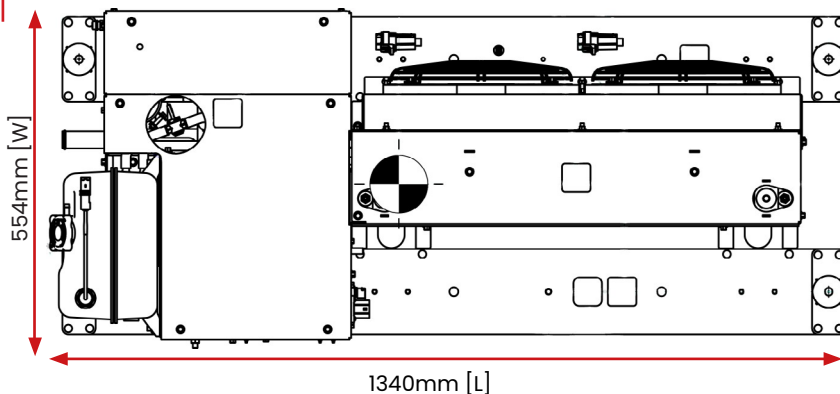
## SYSTEM OVERVIEW

Utilising the latest advancements in control and design, our GEN3 BTMS provides advanced functions for the critical thermal management of vehicle battery systems. Designed to work across a wide range of applications and markets across the world the GEN3 builds on the performance and reliability of the previous generation BTMS designs. The standard model maximises performance with a condenser module separate to the chiller, pump and controls unit.

### KEY FEATURES:

- Configurable with active cooling, passive cooling and/or heating options
- Suitable for roof mounting or chassis/body mounting
- Integrated water pump
- CAN J1939 "plug and play" control
- CAN boot loader for easy software updates
- DMI diagnostics messages on CAN network
- Fuseless smart power distribution on LV circuits
- Electric expansion valve
- Pressure transducers for fan speed regulation
- Brushless fans
- Lightweight header tank
- 24VDC for controller, fans and pump
- 600V DC nominal, 750V DC max (860V DC max option available)
- Available as a split system to improve integration with vehicle architecture

## DIMENSIONS



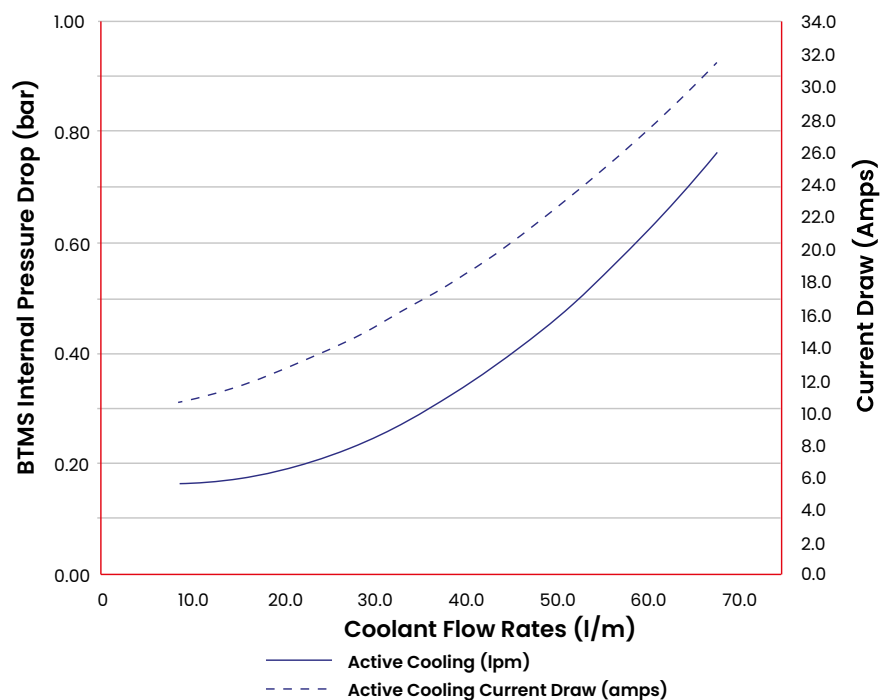
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GEN3 STANDARD	40°C	50°C
Maximum cooling capacity (kW) at: outside temperature (°C) of coolant outlet (°C) of coolant flow (l/m)	11.5 40 25 40	10 50 25 40
Water heating capacity	3.6kW or 5kW	
Operating voltage	600V DC / 24V DC	
24V DC maximum power consumption (pump / fan)	18 + 48A	
600VDC Maximum power consumption (compressor / heater)	6.25A	
Maximum weight (without coolant) (kg) (0AXX variant - active and passive cooling and heating)	74kg	
Dimensions L x W x H (mm)	1340mm (L) x 554mm (W) x 421mm (H)	
Refrigerant type Charge weight (kg)	R134a / 407C Optional 1.2kg	
Connector types (High voltage (4-Pin)) 24V DC & Control Protocol via CAN J1939	TE Connectivity (HVA280) Deutsch (HDP24/26)	
Integrated header tank	Yes	
Outlet size O.D. (mm)	Ø 28.75 mm	
Anti-vibration mounts	Included	
Fan technology	Brushless Motor	
Integrated water pump	Yes (brushless motor)	
Option for remote water heater	Yes – up to 35kW	

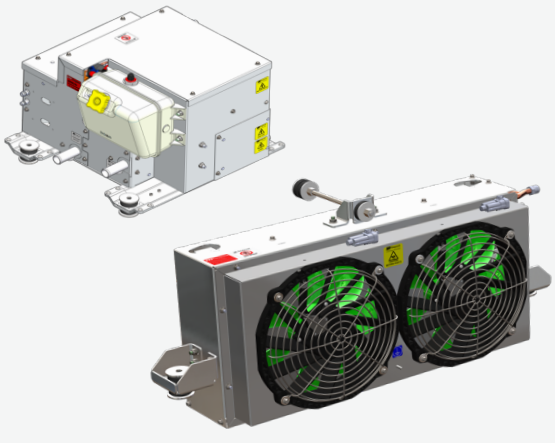
Active Cooling Circuit Internal Pressure Drop



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## PART NUMBERS:

**3A-6725-0EXX** - Split System - Active/Passive Cooling & Heating

**3A-6725-0FXX** - Split System - Active/Passive Cooling Only

**3A-6725-0GXX** - Split System - Active Cooling & Heating

**800V DC capability available. Enquire today for more information.**

## SYSTEM OVERVIEW

Utilising the latest advancements in control and design, our GEN3 BTMS provides advanced functions for the critical thermal management of vehicle battery systems. Designed to work across a wide range of applications and markets across the world the GEN3 builds on the performance and reliability of the previous generation BTMS designs. The split model is designed for easy packaging with the condenser assembly separate to the chiller, pump and controls unit.

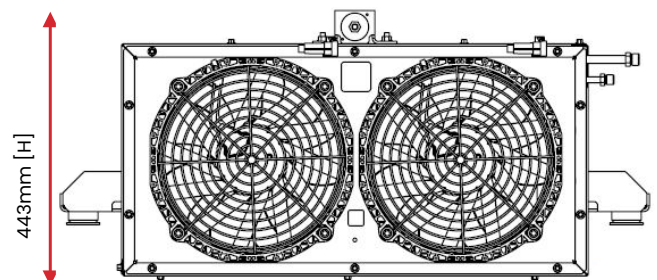
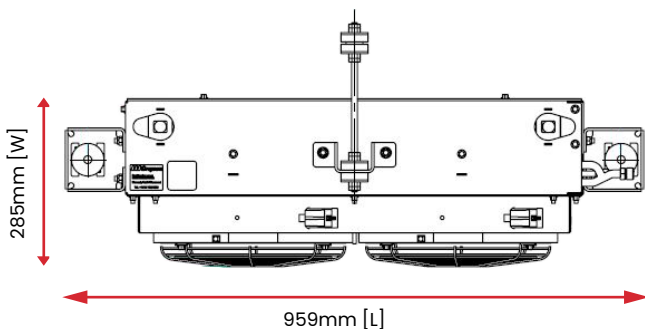
### KEY FEATURES:

- Configurable with active cooling, passive cooling and/or heating options
- Suitable for roof mounting or chassis / body mounting
- Integrated water pump
- CAN J1939 "plug and play" control
- CAN boot loader for easy software updates
- DMI diagnostics messages on CAN network
- Split unit for ease of packaging
- Fuseless smart power distribution LV circuits
- Electric expansion valve
- Pressure transducers for fan speed regulation
- Brushless fans
- Lightweight header tank
- 24VDC for controller, fans and pump
- Supplied with link harness + refrigerant hose kit
- 600V DC nominal, 750V DC max (860V DC max option available)

— Refrigerant gas charge required at the time of installation

## DIMENSIONS

### CONDENSER AND FAN ASSEMBLY

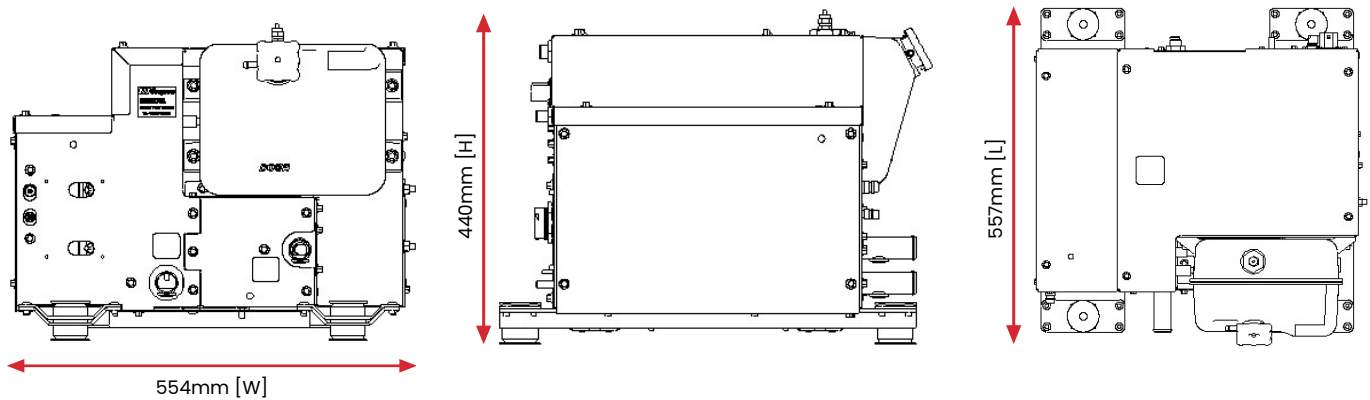


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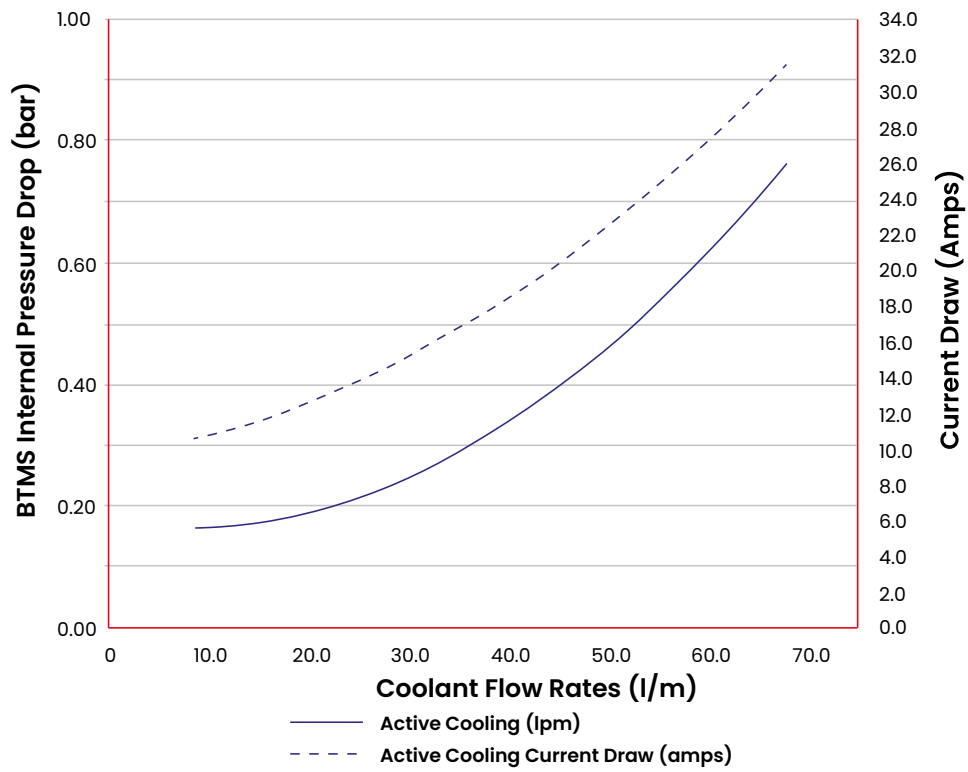
## REFRIGERANT CHILLER ASSEMBLY



## TECHNICAL INFORMATION

GEN3 Split	40°C	50°C
Maximum cooling capacity (kW) at: outside temperature (°C) of coolant outlet (°C) of coolant flow (l/m)	11.5 40 25 40	10 50 25 40
Water heating capacity	3.6kW (5kW Optional)	
Operating voltage	600V DC / 24V DC	
24V DC Maximum power consumption (pump / fan)	18 + 48A	
600VDC Maximum power consumption (compressor / heater)	6.25A	
Maximum weight (without coolant) (kg) (0AXX variant - active and passive cooling and heating)	74kg	
Dimensions L x W x H (mm)	1340mm (L) x 554mm (W) x 421mm (H)	
Refrigerant type Charge weight (kg)	R134a / 407c Optional 1.2kg	
Connector types (High Voltage (4-Pin) 24V DC & Control Protocol via CAN J1939)	TE Connectivity (PA66-GF35) Deutsch (HDP24/26)	
Integrated Header Tank	Yes	
Outlet Size O.D. (mm)	28.75 mm	
Anti-vibration mounts	Included	
Fan technology	Brushless motor	
Integrated water pump	Yes (brushless motor)	
Option for remote water heater	Yes – up to 35kW	

### Active Cooling Circuit Internal Pressure Drop

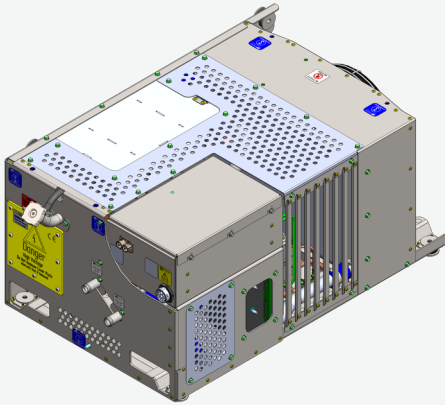


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## PART NUMBER:

**3A-10025-0A02** – Active and Passive Cooling & Heating

## SYSTEM OVERVIEW

Designed specifically for chassis side mount applications, the BTMS X-800V provides precise thermal regulation of temperature-sensitive batteries in the even hottest and coldest of conditions.

The plug-and-play module seamlessly integrates with on- and off-highway applications, managing all battery thermal requirements through its active cooling, passive cooling, and heating modes.

### KEY FEATURES

- -35°C to +45°C operational ambient range
- 8.5kW cooling capacity\*
- Operating voltage range of 575VDC to 800VDC
- Plug-and-play with pre-charged refrigerant gas
- CAN control (J1939)
- Fully integrated refrigerant circuit
- Active cooling, passive cooling and heating modes
- 10kW water heater fitted as standard
- Tailorable heating requirement (5kW to 30kW) to suit operating environment
- Stainless steel frame optional

*\*At 40°C ambient and 25°C coolant temperature*

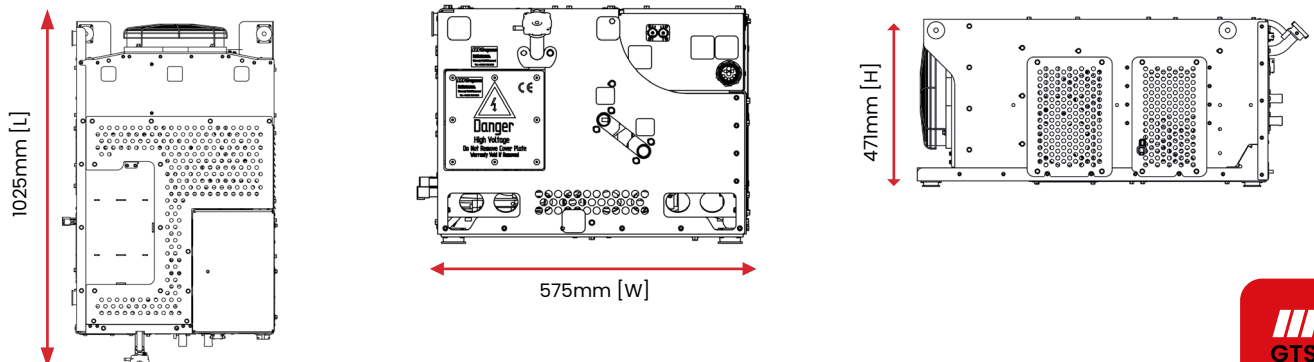
### KEY BENEFITS

**Longer battery life, lower TCO:** Protects the life and optimises the performance of high-value batteries to lower your battery electric or fuel cell electric vehicle's total cost of ownership.

**Easy installation and integration:** Cut installation time and cost with our plug-and-play solution, featuring a fully integrated refrigerant circuit supplied pre-assembled and pre-charged with refrigerant gas.

**Maximum efficiency, minimal power draw:** Our ultra-efficient BTMS includes variable control speed pumps, compressor, fans, and multi-stage water heating to limit battery power consumption.

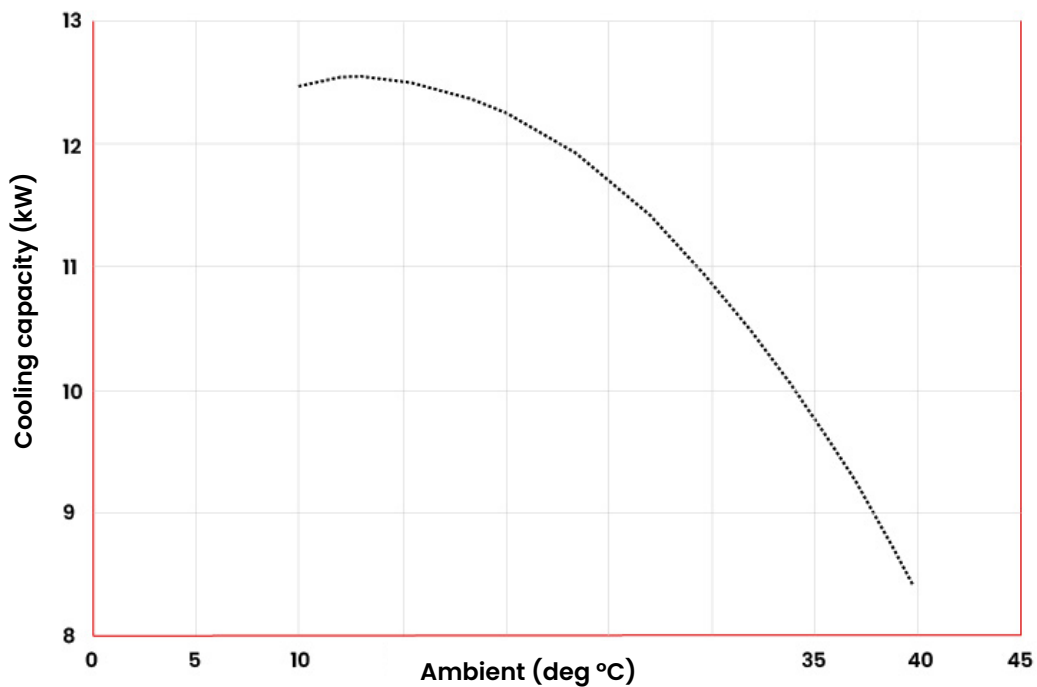
## DIMENSIONS



## BTMS X-800V

Maximum cooling capacity (kW) at: outside temperature (°C) of coolant outlet (°C) of coolant flow (l/m)	8.5 40 25 60
Water heating capacity	10kW as standard
Operating voltage	575V DC / 800V DC
HV DC Maximum power consumption (pump / fan)	55A @ 800V DC
LV DC Maximum power consumption (compressor / heater)	44A
Maximum weight (without coolant) (kg)	119kg
Dimensions L x W x H (mm)	1025mm (L) x 471mm (H) x 575mm (W)
Refrigerant type Charge weight (kg)	R134a 2.4
Connector types (High voltage (4-Pin)) Connector types (Low voltage)	PL184X-4I-6 DEUTSCH HDP24
Integrated header tank	Yes
Outlet size O.D. (mm)	Ø 25mm
Anti-vibration mounts	Included
Fan technology	Brushless motor
Integrated water pump	Yes (brushless motor)

**Cooling capacity vs Ambient @ 25°C coolant**



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