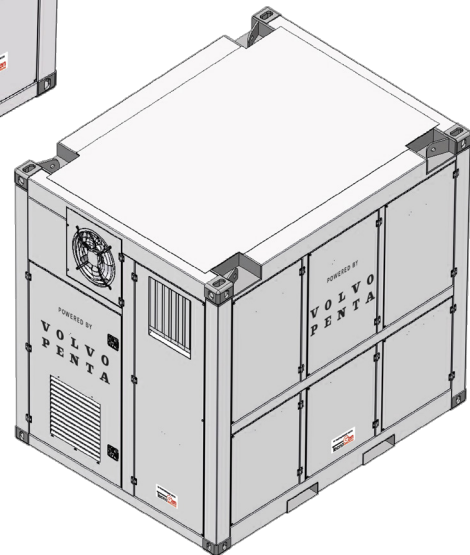
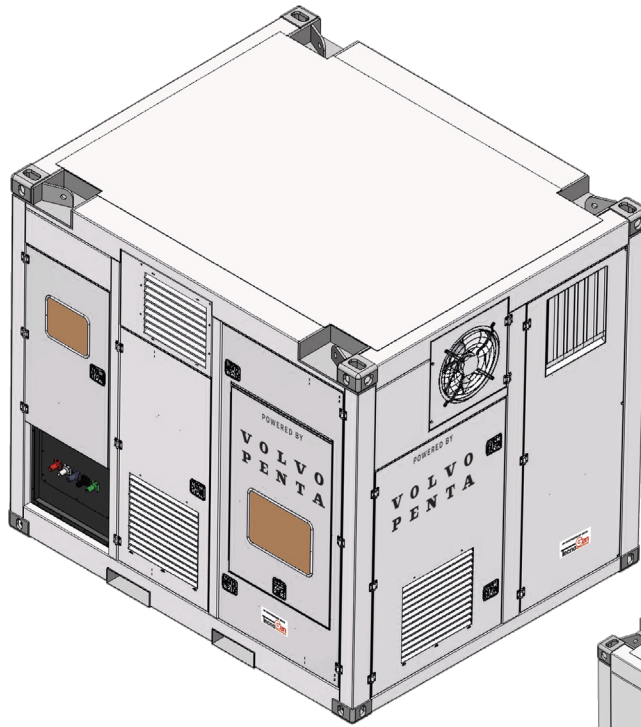


BATTERY ENERGY STORAGE SYSTEM

BESS. The Smart Storage System with Lithium Battery and Integrated Inverter/Charger



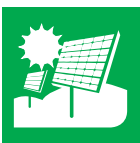
STANDARD EQUIPMENT

- Digital Control Panel
- Distribution Panel
- 4 corner lifting points
- Forklift pockets

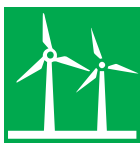
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**VOLVO
PENTA**

POWER SOURCES



SOLAR



WIND



GENERATOR



MAINS

APPLICATIONS



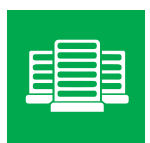
CONSTRUCTION



DISASTER RELIEF



EVENTS



UPS

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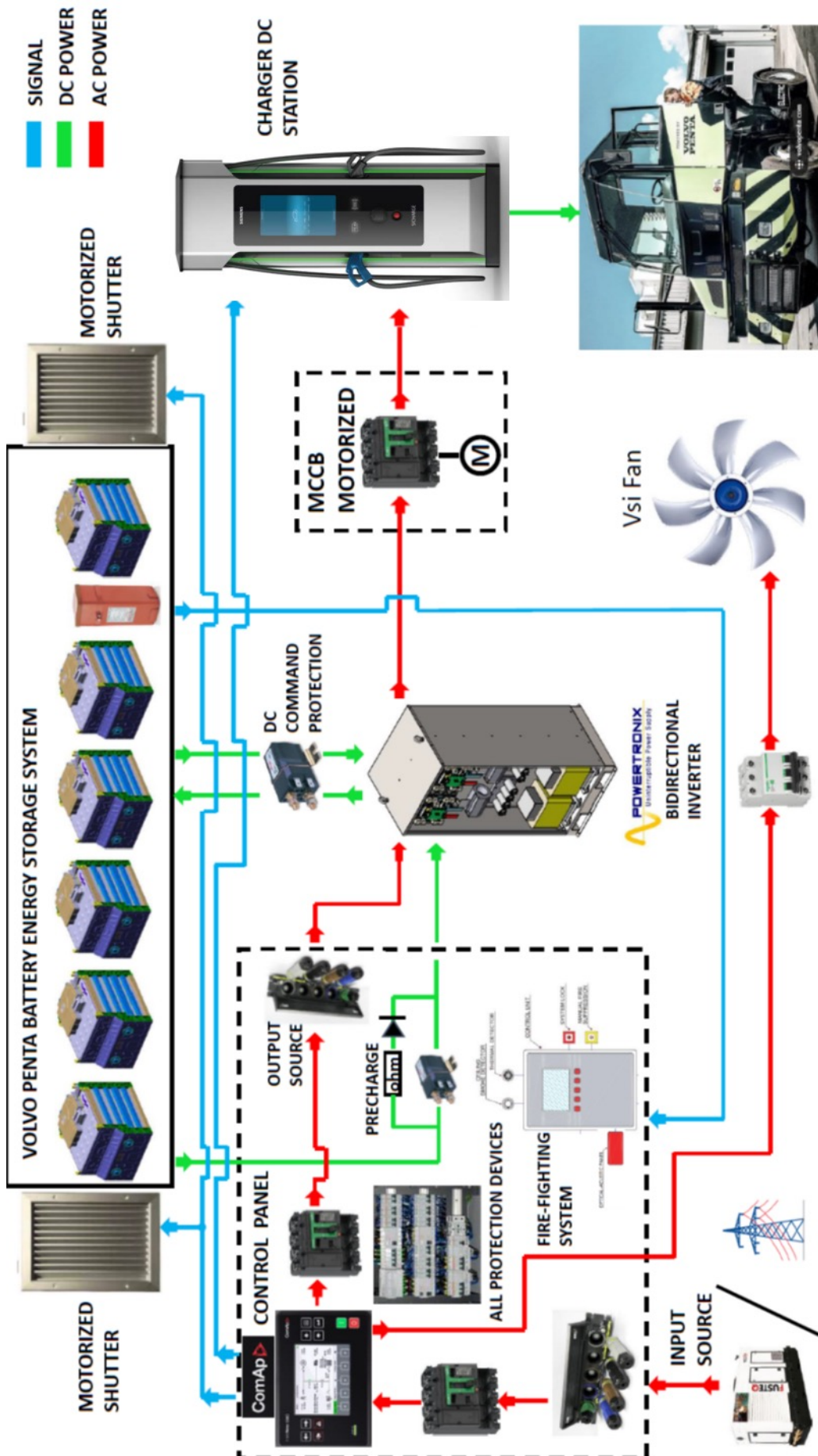
BATTERY ENERGY STORAGE SYSTEM

BATTERY ENERGY STORAGE SYSTEM		
GENERAL TECHNICAL DATA		
Rated voltage	VAC	150 - 1000
Nominal energy storage	kWh	540
CCS2 power	kW	180/300
Communication technology		CAN bus
Sound power level	dB(A)	<65
Protection degree		IP44
Battery Quantity	units	6
BATTERY		
Battery nominal voltage	VDC	653.4
Model		CUBE
Brand		Volvo Group
Nominal Battery Capacity	Ah	135.84
Max. Continuous Charging power	kW	51kW at 50% SOC considering operational limits
Max. Continuous Discharging power	kW	35kW at 10% SOC 109kW at 90% SOC considering operational limits
INVERTER		
Quantity	units	1
Continuous power at power factor = 0,8	kVA	320
PERFORMANCE		
Recharging time (@ 80% DoD) @50kW	Time [h]	8,5
Recharging time (@ 80% DoD) @100kW	Time [h]	4,5
Recharging time (@ 80% DoD) @200kW	Time [h]	2,5
Operating temperature	°C	-20 to +45*
CONTROL		
Energy management system		ComAp
Battery management system (BMS)		Volvo Penta
INLET connection		CAMLOCK (400A max 200KW)
OUTLET connection		COMBO 2 x CCS2 (Refer to Charger Data for other options)
Dimensions (L x W x H)	mm	2991x2438x2591
Weight	kg	~7600

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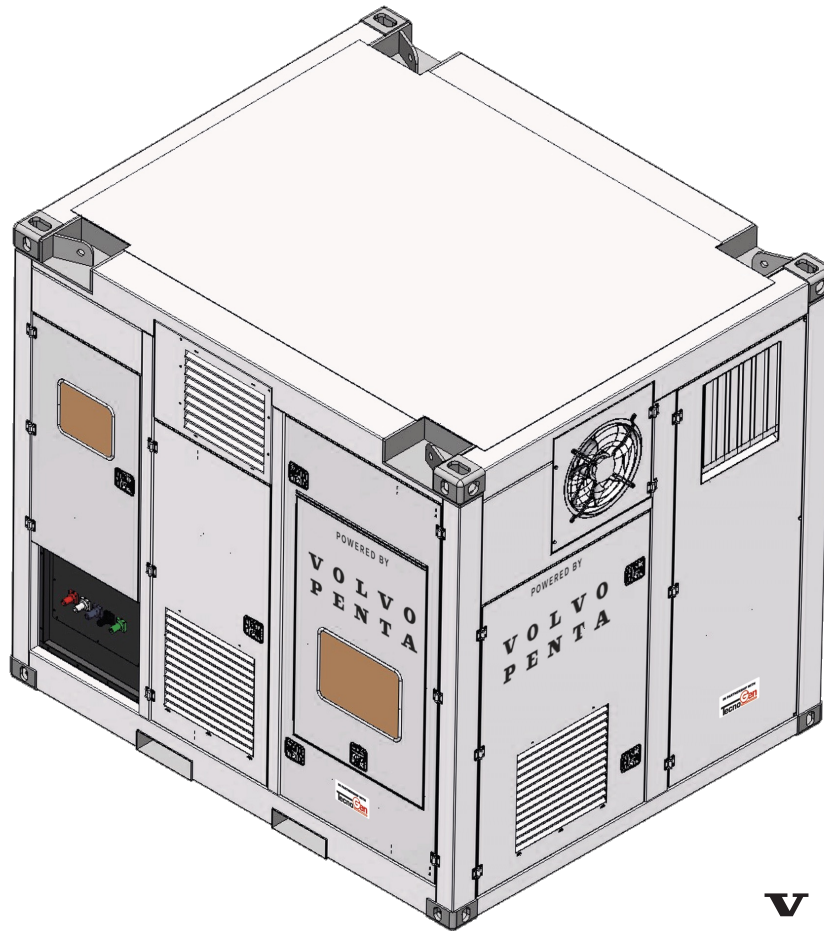
BLOCK DIAGRAM



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10' ISO CONTAINER



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**V O L V O
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HANDLING

- Forklift pockets
- BGG certified corner blocks

FIRE EXTINGUISHER SYSTEM

- Emergency motorized shutters and SFE powder aerosol technology

VENTILATION

- Battery ventilation through motorized shutters
- Forced ventilation with fans powered by inverter

INSULATION

- Class 1, thermal insulation

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CHARGING STATION

SIEMENS SICHARGE D - Technical Specifications

AC nominal input

Voltage	V	400 ± 10%
Current at nom. voltage per phase	A	301 / 332 / 423 / 515 (incl. AC socket)
Frequency	Hz	50 / 60
Power factor	cos phi	> 0.99 at full load
Short circuit current rating	kA	50
THDi	%	< 3
Network type		TN-C, TN-S or TT

DC output

Rated power	kW	180 / 300
Upgradeability	kW	up to 300
Voltage (range)	V	150...1,000
Outlet options		DC: 2 x CCS2 or 1 x CCS2 and 1 x CHAdeMO 1.2 Optional AC: AC Type 2 socket (with flap and shutter), 22 kW incl. RCD CCS2: 1 x 400 (air-cooled cable), 1 x 500 (liquid-cooled cable) CHAdeMO: 1 x 125 / 200
Current of connected cables (max.)	A	

Interface for additional dispenser¹⁾

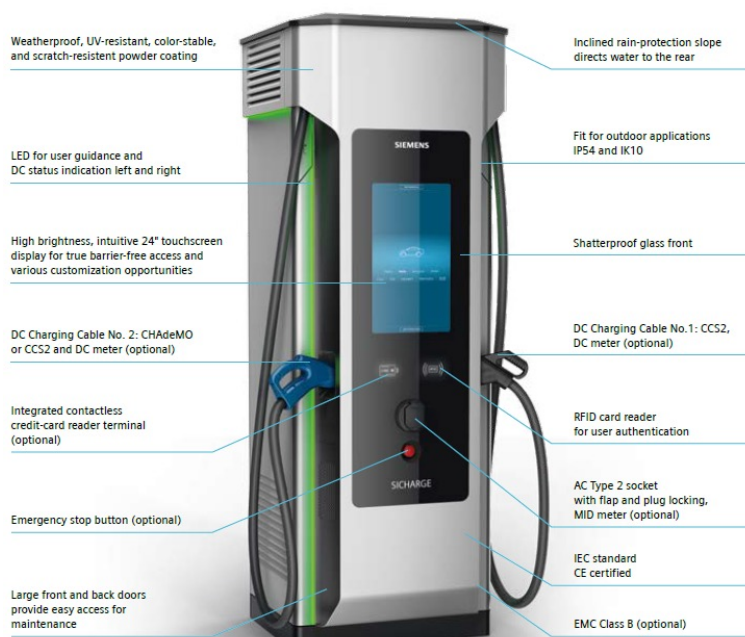
(parallel charging)		Preinstalled interface for one dispenser with two DC charge points
Efficiency factor η	%	> 95 rated, > 96 peak
Cable lengths	m	3.1; 5

Environmental conditions

Operational environment		Indoor and outdoor
Operating temperature	°C	- 25...+55 (without power derating up to + 35) ²⁾
Operating altitude	m	2,000 above sea level
Relative humidity	%	5...95 (non condensing)

Mechanical specifications

Enclosure protection		IP54, IK10 (including display)
Casting material		Powder-coated galvanized steel, Anti-Graffiti paint
Coating		C4-M / C5-L
Color		RAL 9006 – White aluminum
Overall dimensions W x D x H	mm	845 x 820 x 2,300
Foundation dimensions W x D	mm	680 x 620
Approx. weight acc. to configuration	kg	540 – 820



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FIRE EXTINGUISHING SYSTEM

MICRO-SOL MS 1000

Technical Specifications

MAIN FEATURES

SFE Weight	1000g (Nominal)
SFE Specific Gravity	1.2 - 1.5 Kg/dm ³
SFE Combustion Velocity	1.1 - 1.2 mm/s
Activation Mode	Elettric
Powdered Aerosol Color	white / light gray
Discharge Time	<80sec
Temperature Range	-20°C to +55°C
Extinguishing Volume	10 m ³
Toxicity	none



In compliance with



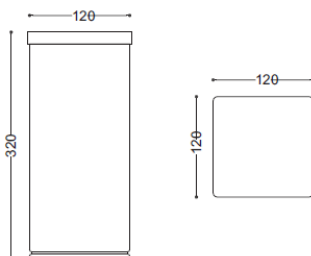
2010
Aerosol
Extinguishing
Technology

ELETTRICAL REQUIREMENTS

Power Supply Voltage	24V (18-32V)
Ignition	Elettrico ("Tipo 1a-1w")
Electrical Continuity Test	All fire - 1 A; No fire - 200 mA

MECHANICAL SPECIFICATION

Dimensions	Width	120 mm
	Height	120 mm
	Length	320 mm
Total weight		12,5 kg

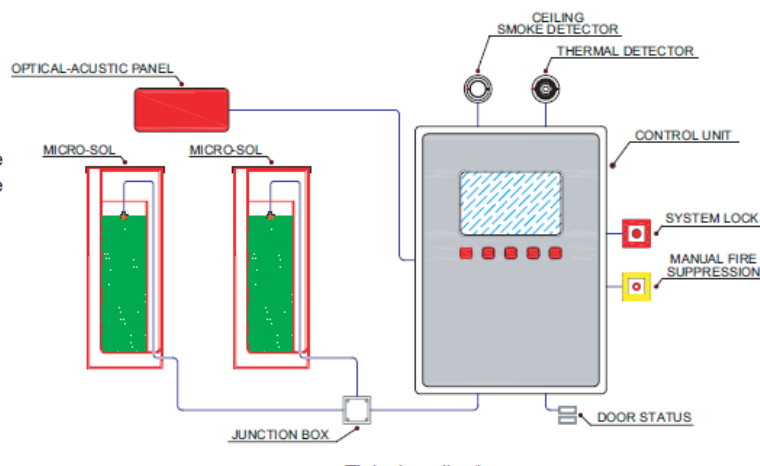


APPLICATION

- Control Rooms (sub floor; above ceiling)
- Electrical Cabinets
- Engine & Compressors Rooms
- Flammable and combustible liquids and gases storage
- Marine Applications
- Server Rooms
- Telecommunications facilities

ENVIRONMENT FRIENDLY

ODP Ozone Depletion Potential	None
GWP Global Warming Potential	None
ALT Atmosphere Life Time	Low



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BI-DIRECTIONAL INVERTER



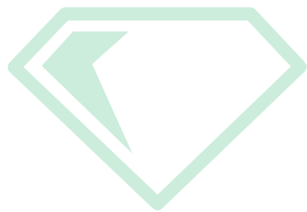
STANDARD FEATURES

- Multilevel IGBT Technology
- Transformer-less topology
- Low distortion sinusoidal current thanks to PWM high frequency IGBT semiconductor technology
- Output Inverter high efficiency power section features low distortion output voltage based on Multilevel IGBT topology
- Forced air system cooling
- Digital control
- Whole power electronics on single removable power module IGBT
- High working frequency
- Mechanical design according to easy maintenance philosophy
- Parallel communication via optical fiber
- Full digital management of the unit controlled by software setting configuration

GENERAL INFORMATION	
Inverter	Multi level IGBT high frequency switching transformer-less
Cooling system	Forced air
ELECTRICAL AC SECTION IN GRID CONNECTED MODE	
Nominal output voltage	3Ph + N 380/400/415Vac
Nominal frequency	50/60Hz
ELECTRICAL AC SECTION IN STAND ALONE MODE	
Nominal output voltage	3Ph + N 380/400/415Vac
Nominal output current (3Ph + N @400V)	320 kW
Nominal frequency	50/60Hz
ELECTRICAL DC SECTION	
Nominal voltage	720Vdc
Max charging current	200A
Max discharging current	250A
MECHANICAL	
Protection level	IP20
Plant wiring	Power Bus BAR
Wiring lock	Present
Service access to control electronic	from the front
ENVIRONMENT	
Operating temperature	0-55°C (with derating over 55 °C)
Relative humidity	< 95% no moisture
Max altitude with no deration	Up to 1000m asl (1% deration every 100m up to and including 2000m)
Storage temperature	-20°C to + 70°C
OTHER FEATURES	
LCD Interface	
EMC class	IEC-EN62040-2 CLASS A
Noise level	60dB(A) at 1m
Air flow rate	1800m ³ /h

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