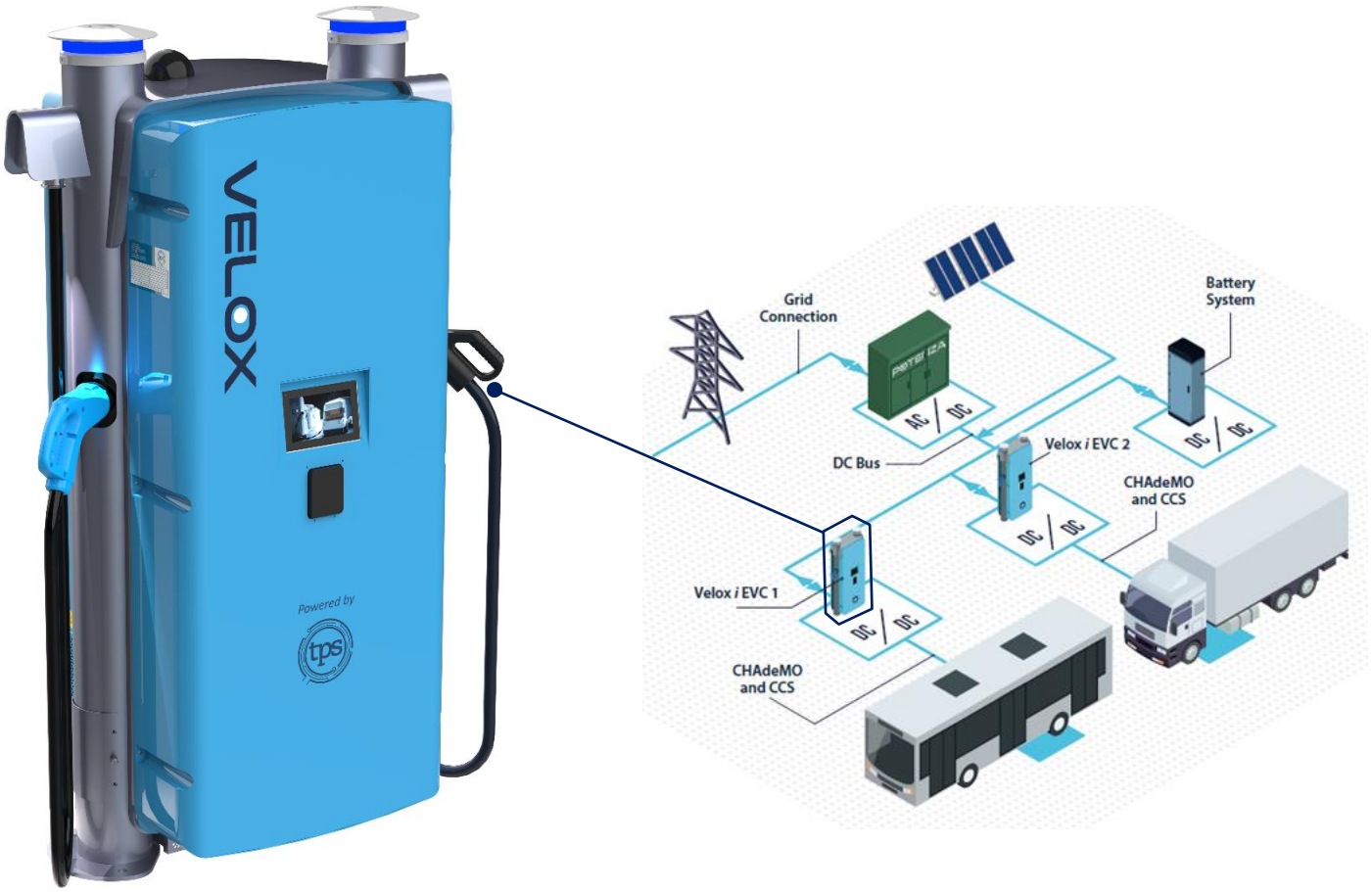
THE POWER OF TOMORROW. TODAY.

VELOX RANGE

ULTRA-RAPID DC EV CHARGERS



POWER PRECISELY WHERE YOU NEED IT

Turbo Power Systems' highly flexible range of EV chargers cater for any fleet application with powers ranging from 30 kW to over 1 MW, and footprints suited to new or existing fleet vehicle compounds or forecourts.

Our VELOX chargers seamlessly integrate with our state-of-the-art SMART FLEET DC Grid charging system or serve as a powerful stand-alone charging solution.

MCS READY

SMART FLEET

V2X COMPATIBLE

COMMON FEATURES AND OPTIONS

FEATURES

Designed and manufactured in the UK incorporating TPS own technologically advanced power electronics hardware

Engineered with TPS proven 30-year life design and service support

V2G and V2X compatible, enabling the vehicle to support on site power requirements and electricity export

Modular and scalable with a range of single head, dual head and satellite chargers

Compatible with CCS Type 1 / Type 2, NACS, CHAdeMO and future *MCS standards

Supports battery voltages up to 920 V with electronic modules 1,250 V capable for future *MCS charging (See VELOX *m* chargers)

Silicon Carbide (SiC) design for near silent operation and high efficiency (up to 98%)

5 meters charging cable length as standard, with cable lengths up to 10 meters, depending on charger type and rating

OCPP v1.6 and v2.01 for CPO or fleet operator back-office integration

24-month warranty as standard

Compliant with IEC 61851-1, IEC 61851-23, IEC 61851-21-2, ISO 15118, SAE J3400 standards for safety of EV charging devices

OPTIONS

Dynamic Power Allocation Matrix to optimize charging performance (applicable to Velox *c* and *m* chargers)

Charging authentication device options: Payment terminal, RFID or 'free vend' mode

Vehicle to Grid - V2G and Vehicle to Anything - V2X upgrade available

HMI / user display / language options

Flexible cable selection – CCS / NACS / CHAdeMO or a mixture. High power CCS / NACS and *MCS if required

High visibility LED dispenser status lighting

Communication options: 4G/5G or Ethernet to suit customer needs and infrastructure

OTA (Over The Air) updates to avoid site visits for the implementation of the latest product features and firmware

Monitoring and diagnostic packages are available to suit customer requirements

Extended warranty and O&M packages are available to suit customer requirements

* Official release of the MCS standard coming soon, but TPS is already integrating its key specifications into our cutting-edge products

MCS READY

SMART FLEET

V2X COMPATIBLE

VELOX *c* : ULTRA-RAPID DC COMPACT EV CHARGER

VELOX c chargers deliver unparalleled flexibility, scaling ultra-rapid charging solutions to meet the needs of everything from passenger vehicles to electric heavy goods vehicles (eHGVs), including buses and freight. By housing the DC-DC electronics in a central equipment enclosure, plant room or substation, VELOX c chargers boast an ultra-low footprint, making them ideal for installation in vehicle-dense compounds, depots, and forecourts.

KEY FEATURES

- Modular and scalable design allows solution schemes up to 600 kW per charger, with flexible increments of 150 kW
- Chargers naturally cooled up to 300 kW output
- CCS / NACS / CHAdeMO / *MCS compatible
- Add 100 km range to an eHGV (520 kWh battery) in <17 mins
- V2X capable including V2G when used with a POTENZA Distribution Grid Inverter
- Options to connect direct to 11,000 or 12,000 V Medium Voltage using a POTENZA Distribution Transformer Rectifier for larger charging schemes
- Optional Dynamic Dispenser Power Allocation Switching Matrix available

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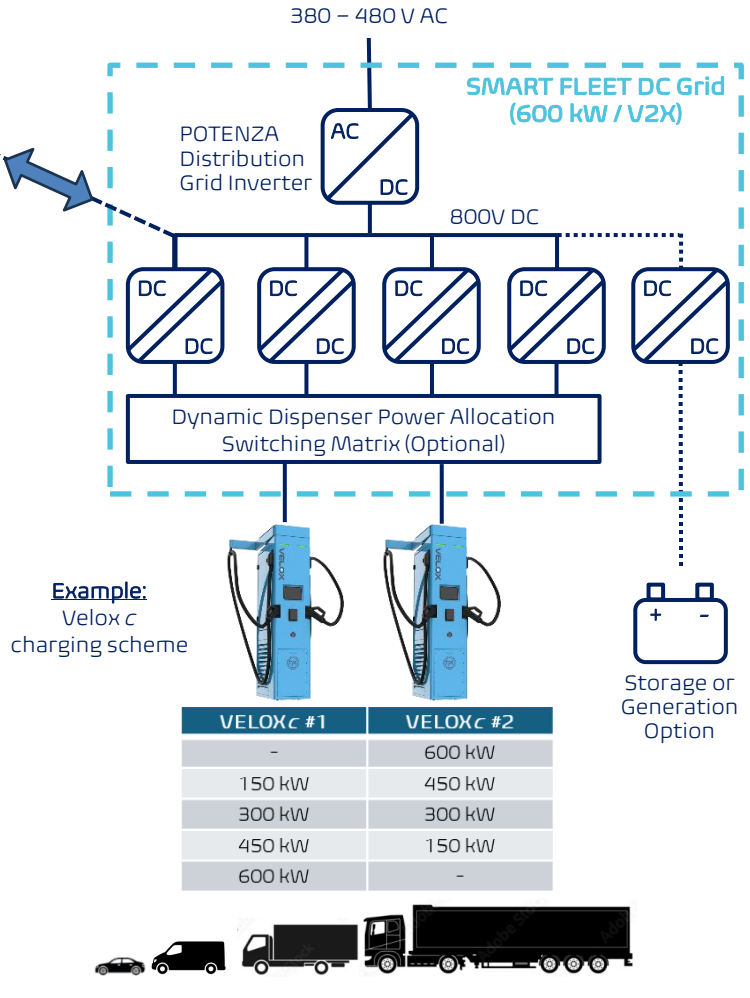


VELOX*c* #1	VELOX*c* #2
-	600 kW
150 kW	450 kW
300 kW	300 kW
450 kW	150 kW
600 kW	-

MCS READY

SMART FLEET

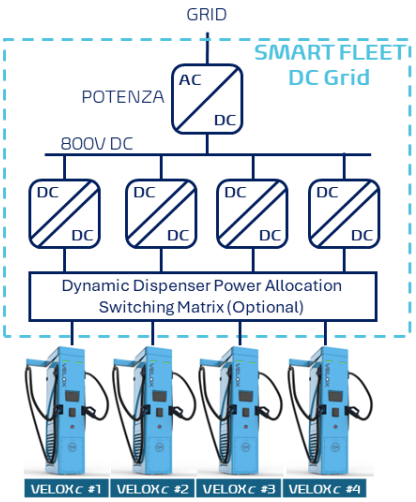
V2X COMPATIBLE

VELOX *c*		
TECHNICAL DATA	Dispenser	Power Electronics Cabinet
Electrical		
Power	150 – 600 kW	
Input DC Voltage	150 - 1,250 V	800 V (from POTENZA)
Input DC Current	200 - 800 A	193 - 773 A
Output DC Voltage	150 - 1,250 V	
Output DC Current	200 - 800 A	
Average Efficiency	>97%	
General Data		
Dimensions **excluding charging plugs*	*400 (W) x 1,906 (H) x 650 (D) mm	2,193 (W) x 1,850 (H) x 1,400 (D) mm
Weight	175 kg	1,350 kg
Cooling	Forced Air up to 300 kW / 400A Liquid > 300 kW / 400 A	Forced Air
Ingress Protection Rating	IP54 Electronics Protection	
Operating temperature range	-20 °C to +50 °C	
Storage temperature range	-40 °C to +60 °C	
Humidity	< 95% non-condensing	
User		
Charging Plug	CCS / NACS / CHAdeMO / MCS	-
Authentication Options	Payter Apollo / RFID / Plug & Charge	-
User Display	HMI	
Charging Status Indication	Programmable LED (option)	LED indicator
Communication	OCPP v1.6 & v2.01 available	Modbus TCP / IP
Modes available	G2V / V2G / V2X	
Standards		
Certificates, standards, directives	CE, UKCA, IEC 62477-1, IEC 61851, IEC 62196, ISO 15118-20, SAE J3400	
EMC standards	EN61000-6-2, EN 61000-4-4, EN 61000-4-5, EN 61000-4-6, EN 61000-4-2, EN 61000-6-4, IEC 61851-21	
Metering	VDE-AR-E 2418-3-100 DIN EN 50470	-

Note: customised charger designs available, see Velox b charger section

USE CASE: COMPACT HUB & SPOKE 4x 150 kW / 2x 300 kW / 1x 600 kW DYNAMICALLY CONFIGURABLE

As illustrated, the VELOX *c* charger is ideal for creating dynamically reconfigurable, multi-charging dispenser satellite hubs for moving available capacity between multiple fleet vehicles as demands and priorities dictate. This approach using multiple chargers and DC-DC converters, enables total charging infrastructure optimization such that the POTENZA Distribution Grid Inverter or POTENZA Distribution Transformer Rectifier (*see TPS POTENZA RANGE EV Grid Connection datasheets*) supplying the chargers from the grid is fully utilized whether 4 chargers demand quarter of the available capacity each, 2 chargers half of it or 1 single charger the full POTENZA rating capacity.



VELOX*c* #1	VELOX*c* #2	VELOX*c* #3	VELOX*c* #4
150 kW	150 kW	150 kW	150 kW
300 kW	-	300 kW	-
600 kW	-	-	-

Example: Velox*c* chargers dynamically configurable

MCS READY

SMART FLEET

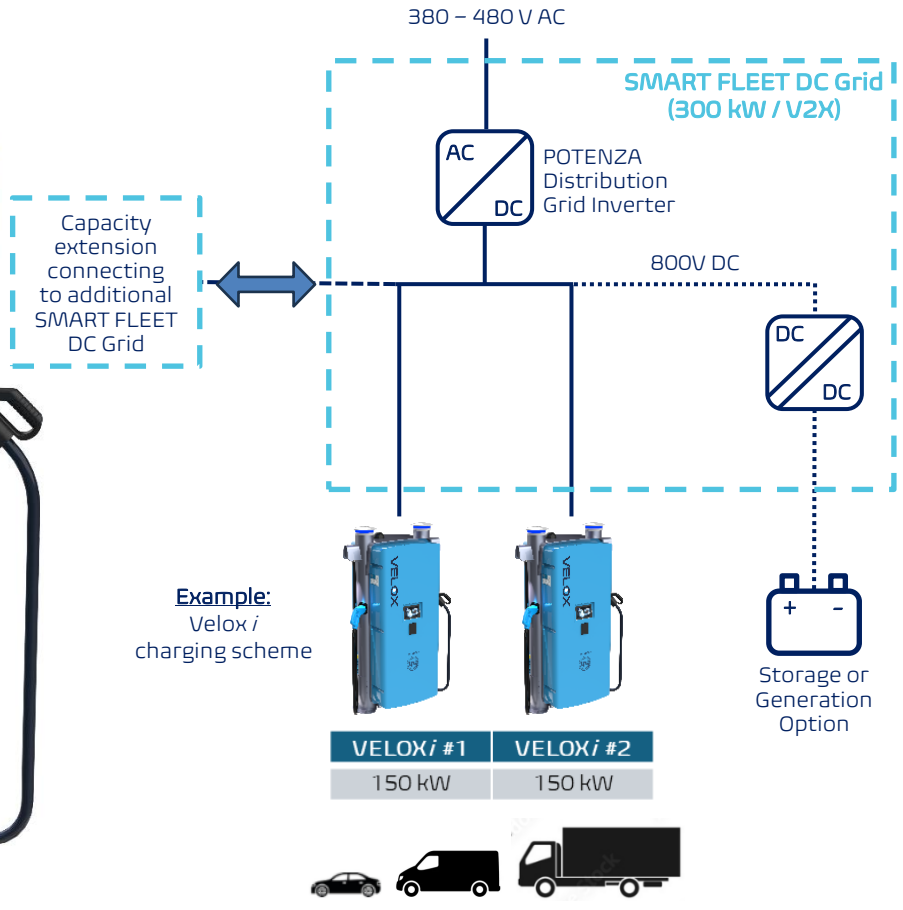
V2X COMPATIBLE

VELOX *i*: ULTRA-RAPID DC INTEGRATED EV CHARGER

VELOX i chargers are perfectly suited for DC ultra-rapid charging of lighter fleet vehicles such as passenger cars, light goods vehicles (LGVs ~7.5T) as well as larger vehicles parked for periods of time, such as refuse collection vehicles. The charger itself houses the DC-DC charging electronics, reducing the space required in the central equipment enclosure, plant room or substation.

KEY FEATURES

- Up to 120 kW
- Fast charge of batteries up to 920 V
- Add up to 100km range to an LGV (126 kWh battery) in <25 minutes
- Force air cooled electronics with naturally cooled charging cable
- CCS / NACS / CHAdeMO compatible
- V2X capable including V2G when used with a POTENZA Distribution Grid Inverter
- Options to connect directly to 11,000 or 12,000 V Medium Voltage using a POTENZA Distribution Transformer Rectifier for larger charging schemes



MCS READY

SMART FLEET

V2X COMPATIBLE

VELOX *i*	
TECHNICAL DATA	
Electrical	
Power	120 kW
Input DC Voltage	800 V
Input DC Current	155 A
Output DC Voltage	150 – 920 V
Output DC Current	200 A
Efficiency	>97%
General Data	
Dimensions **excluding charging plugs*	*1,070 (W) x 1,813 (H) x 623 (D) mm
Weight	377 kg
Cooling	Forced Air
Ingress Protection Rating	IP54 Electronics Protection
Operating temperature range	-20 °C to +50 °C
Storage temperature range	-40 °C to +60 °C
Humidity	< 95% non-condensing
User	
Charging Plug	CCS / NACS / CHAdeMO
Authentication Options	Payter Apollo / RFID / Plug & Charge
User Display	HMI
Charging Status Indication	Programmable LED (option)
Communication	OCPP v1.6 & v2.01 available (v2.01 with single outlet only)
Modes available	G2V / V2G / V2X
Standards	
Certificates, standards, directives	CE, UKCA, IEC 62477-1, IEC 61851, IEC 62196, ISO 15118-20, SAE J3400
EMC standards	EN61000-6-2, EN 61000-4-4, EN 61000-4-5, EN 61000-4-6, EN 61000-4-2, EN 61000-6-4, IEC 61851-21
Metering	VDE-AR-E 2418-3-100, DIN EN 50470

Note: customised charger designs available, see Velox b charger section

USE CASE: EMPOWERING VEOLIA'S €4 BILLION DECARBONISATION VISION

The ultimate bi-directional DC ultra-rapid charging solution for Veolia's electric refuse collection trucks significantly reduces operational electricity costs and supports Veolia's ambitious decarbonization goals using our cutting-edge VELOX *i* charger and POTENZA Distribution Grid Inverter technology.

With batteries four times larger than average electric cars and ideal standby times, Veolia's trucks are perfect for energy arbitrage and aggregation, which was previously not possible due to the lack of scalable V2X technology. VELOX and POTENZA now provide the power and responsiveness needed for high tariff offset and aggregation contributions, ensuring the trucks are always ready for operation.

MCS READY SMART FLEET V2X COMPATIBLE

VELOX *m* : ULTRA-RAPID DC MEGAWATT EV CHARGER

VELOX *m* chargers uniquely address the need for Megawatt Charging System (*MCS) ready solutions for the electric heavy goods vehicles (eHGVs) of the future, including freight distribution. The same charging system serves a number of CCS or NACS vehicles from the same high power, high voltage and highly configurable central power hub, ensuring your charging infrastructure investment is effective today and protected for decades to come.

KEY FEATURES

- 1.2 MW capacity, configurable for up to 8x CCS / NACS chargers per SMART FLEET DC Grid
- Simple *MCS upgrade is possible as 1,250 V charging capability is already provisioned
- Small footprint, compact chargers up to 600 A charging (CCS / NACS) and 1,600 A (*MCS)
- Additional VELOX *m* chargers can be connected to achieve higher *MCS power outputs of 3.75 MW / 3,000 A and beyond
- Single VELOX *m* charger able to charge an eHGV (624 kWh battery) in <30 mins with *MCS
- 11,000 or 12,000 V Medium Voltage grid connection using POTENZA Distribution Transformer Rectifier, avoiding the need for separate step-down distribution transformers
- V2X capable, including V2G when used with a POTENZA Distribution Grid Inverter
- Optional Dynamic Dispenser Power Allocation Switching Matrix available

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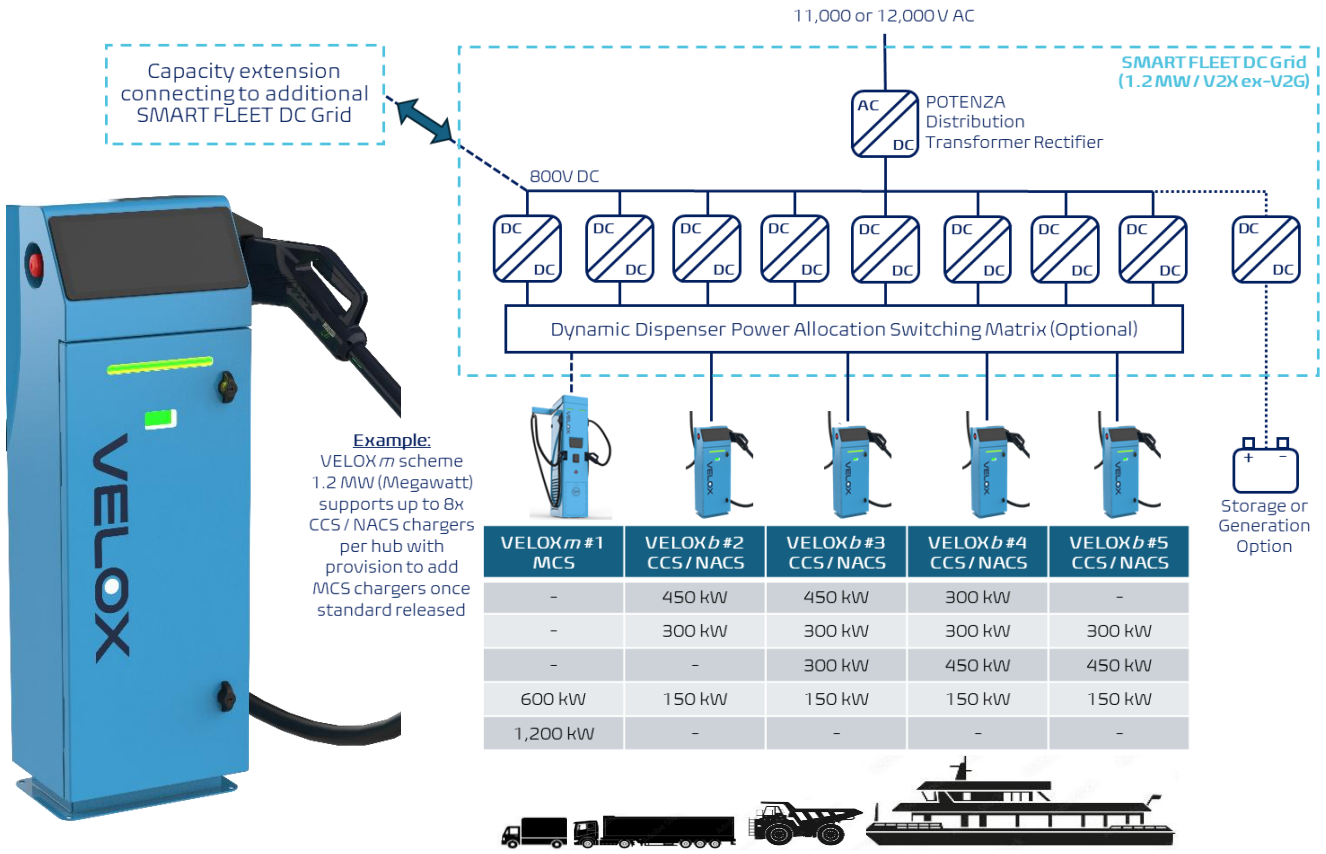

Example:
VELOX *m* scheme 1.2 MW (Megawatt) supports up to 8x CCS / NACS chargers per hub with provision to add MCS chargers once standard released

VELOX *m* #1 MCS	VELOX *b* #2 CCS / NACS	VELOX *b* #3 CCS / NACS	VELOX *b* #4 CCS / NACS	VELOX *b* #5 CCS / NACS
-	450 kW	450 kW	300 kW	-
-	300 kW	300 kW	300 kW	300 kW
-	-	300 kW	450 kW	450 kW
600 kW	150 kW	150 kW	150 kW	150 kW
1,200 kW	-	-	-	-

MCS READY

SMART FLEET

V2X COMPATIBLE

VELOX *m*		
TECHNICAL DATA	Dispenser	Megawatt Charging Cabinet
Electrical		
Power	1,200 kW	
Input DC Voltage	150 – 1,250 V	800 V (From POTENZA)
Input DC Current	See dispenser output	1,546 A
Output DC Voltage	150 – 1,250 V	
Dispenser Output DC Current	CCS / NACS: 200 – 600 A; 150 – 450 kW *MCS: 800 – 1,600 A; 600 - 1,200 kW or dynamic allocation (option) of each charging cabinet 200 A output	
Average Efficiency	>97%	
General Data		
Dimensions **excluding charging plugs*	CCS / NACS: *350 (W) x 1,150 (H) x 252 (D) mm	3,500 (W) x 1,850 (H) x 1,400 (D) mm
Weight **excluding cables*	*60 kg	2,000 kg
Cooling	Natural Air up to 300 kW / 400 A Liquid > 300 kW / 400 A	Forced Air
Ingress Protection Rating	IP54 Electronics Protection / NEMA 3R	IP54 Electronics Protection / NEMA 3R
Operating temperature range	-30 °C to +50 °C	
Storage temperature range	-40 °C to +60 °C	
Humidity	< 95% non-condensing	
User		
Charging Plug	CCS / NACS / CHAdeMO / *MCS	-
Authentication Options	Payter Apollo/ RFID / Plug & Charge	-
User Display	HMI	HMI
Charging Status Indication	Programmable LED (option)	LED indicator
Communication	OCPP v1.6 & v2.01 available	Modbus TCP / IP
Modes available	G2V / V2G / V2X	
Standards		
Certificates, standards, directives	CE, UKCA, IEC 62477-1, IEC 61851, IEC 62196, ISO 15118-20, SAE J3400, UL2202, UL 9741, CSA 22.2 No 107.1	
EMC standards	EN61000-6-2, EN 61000-4-4, EN 61000-4-5, EN 61000-4-6, EN 61000-4-2, EN 61000-6-4, IEC 61851-21	
Metering	VDE-AR-E 2418-3-100, DIN EN 50470, DMS compliant CTEP, NTEP (Nist Handbook 44)	-

Note: customised charger designs available, see Velox b charger section

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USE CASE: CCS / NACS TODAY AND MCS TOMORROW. THE SCALABLE SOLUTION FOR POWER HUNGRY DISTRIBUTION DEPOTS

Why invest in CCS / NACS chargers today when MCS will provide far faster charging on its release in the future?

A very good question posed by distribution depot operators and landlords who face the unenviable challenge of electrifying substantial fleets of very large trucks, each with battery capacities in the order of 600 to 900 kWh. Moving from CCS / NACS to MCS charging in the future can reduce the charging time of these vehicles by a factor of 4, resulting in charging times of less than 30 minutes, meaning depot operators can consider operational logistics models that closely resemble those used today when fueling conventional vehicles.

With VELOX *m* chargers, depot operators can invest confidently today, knowing their infrastructure is future proofed. The VELOX *m* chargers handle battery outputs from 150 to 1,250 V, meeting all charging standards, including MCS, and offer bi-directional functionality for V2X operations. Configured to suit any current fleet needs with up to 1.2 MW capacity, the VELOX *m* allows for easy addition of alternative VELOX chargers, making it the most cost-effective, upgradable solution in the market, facilitating seamless switch over to MCS once vehicles become available, without the need for extra power electronics.

To further safeguard your investment, VELOX *m* chargers offer an expandable configuration. As you need to add more capacity through battery storage and/or embedded generation, simply integrate these new sources with the SMART FLEET DC Grid seamlessly and add more chargers as required. By expanding grid capacity and utilizing VELOX *m* chargers, you can connect multiple schemes and maximize your system's potential, reaching the MCS standard of 3.75 MW / 3,000 A and beyond in the future!

MCS READY

SMART FLEET

V2X COMPATIBLE

VELOX

ARE YOU LOOKING FOR SOMETHING DIFFERENT?

VELOX *b* : ULTRA RAPID DC BESPOKE EV CHARGER

We offer a wide range of VELOX charger models, but we know that one size doesn't fit all. If you have specific needs, such as wall or post mounting, white labelling, or customizing the charger interface layout, we are here to help. Let's create a solution that's perfect for you!

Explore the various designs we have crafted for our customers and imagine the possibilities for your own tailored VELOX charger.

Ready to customize your charging solution? Contact us today!

TPS is a leading UK designer and manufacturer with over 45 years of expertise in delivering cutting-edge transportation and critical infrastructure industrial electrical energy systems.

We will be happy to discuss your project or enquiries further, please contact our sales department at sales@turbopowersystems.com or ring us on +44 (0) 191 482 9227

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