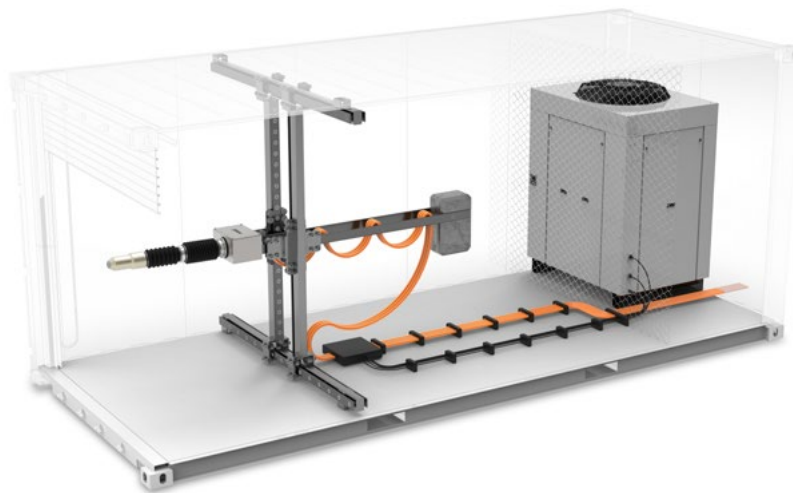


PROTOTYPES | PRODUCT DATASHEET

Quick Charging Connector 5000 – QCC-5000

**Product Description****Scope of delivery:**

The QCC-5000 plug and socket is a very powerful connector intended to be used for fast charging of big electric vehicles, like dump trucks in Mines. As it is fully protected and ruggedized, it is an ideal fit for harsh environments like the mining industry. It consists in a socket, to be integrated into the electric vehicle. A plug with long cooled cables to transfer high currents in a flexible way. A chiller which furnishes the proper cooling power to the system. A distribution box can also be used for easy interconnection of the cooling circuit to the chiller and the electrical power lines to the charging station.

Intended use:

While the QCC product family has been used and proven in the field for many years, for example in ports, the available QCC-5000 plug and socket are prototypes only. They are not fully validated and should be considered as such. QCC-5000 components are intended for lab and field tests, to get fast learnings on high power charging in harsh environment.

Standards:

The QCC developed/defined following the listed standards below unless otherwise noted:

IEC 63407

Conductive charging of electric vehicles – Contact interface for automated connection device (ACD)

SAE J3105/3

Electric Vehicle Power Transfer System Using Conductive Automated Connection Devices Enclosed Pin and Socket Connection

IEC 61851-23-1

Electric vehicle conductive charging system – Part 23-1: DC Charging with an automatic connection system.

Environmental conditions	
Ambient Temperature (operation)	-20°C...+80°C (with proper cooling and current derating over +40°C)
Ambient Temperature (storage/transport)	-40 °C...+80 °C
Max. altitude	2000 m (above sea level)
Degree of pollution	3
Protection type – plugged in	IP56

Electrical Properties	
Rated Voltage for power contacts	DC 1500 V (acc. IEC)
Rated Current for power contacts	up to 4250 A cont. (with proper cooling) up to 5000A peak
Maximum charging power	7.5 MW
Overvoltage category	CATIII
Number of power contacts	3 (DC+/DC-/PE)
Rated Voltage for signal contacts	AC 30 V / DC 48 V
Rated current for signal contacts	10 A
Number of signal contacts	6
Temperature monitoring	1x Pt 1000

Mechanical Properties	
Mating Cycles	> 30 000 (without maintenance)
Mating face interface	In accordance with IEC 63407 and SAE J3105/3
Material Mating face/Internal parts	POM
Flammability rating Mating face/Internal parts	HB
Material Contacts	Cu-Alloy
Material Contacts surface contacts	Ag

Temperature sensors	
Type of Sensors	Pt 1000 class B
Standards/Regulations	EN 60751
Measuring range	-50 °C...+180 °C
Information interface	3 wires connection
Derating temperature	90 °C (charging currents derating above this value)
Shutdown Temperature	100 °C (charging currents shutdown above this value)

Cable	
Cable Power structure	6 x 95 mm ² cooled core + 2 x 75mm ² PE core
Power Conductor Resistance (@20 °C)	≤ 0.196 Ohm/km (for each power cable)
Outer Internal Tube diameter (fluid connection)	8 ± 0.25 mm
Inner Internal Tube diameter (fluid connection)	6 ± 0.25 mm
Sheath Material	Polyethylene, highly flexible corsslinked
Outer diameter	17 mm (max)
Minimum bending radius (both cable and DC cores)	6 × Cable diameter
Standards / Regulations	ISO 19642.5 (2019)
Cable Signal structure	6 × 1mm ² min (3x shielded twisted pairs)

Cooling Transport	
Flow rate	12 l/min
Nominal input pressure	~6 bars (for 12 l/min)
Forerun Temperature	15 °C
Cooling Power	Min. 25 kW (for 6 m cable length)
Advised Fluid	Water Glycol
Specific Fluid electrical resistance (@20 °C)	Min. 10 Mohm.cm
Max Pressure	8 bars

Typical Use

The QCC 5000 plug and socket are typically used in conjunction with an actuator which automatizes the mating process. Such actuators can be any 6 axis solutions, like a dedicated multi-axis platform or a robot (see examples below).

It is advised to containerize the complete solution for longer protection and lifetime of the system.

