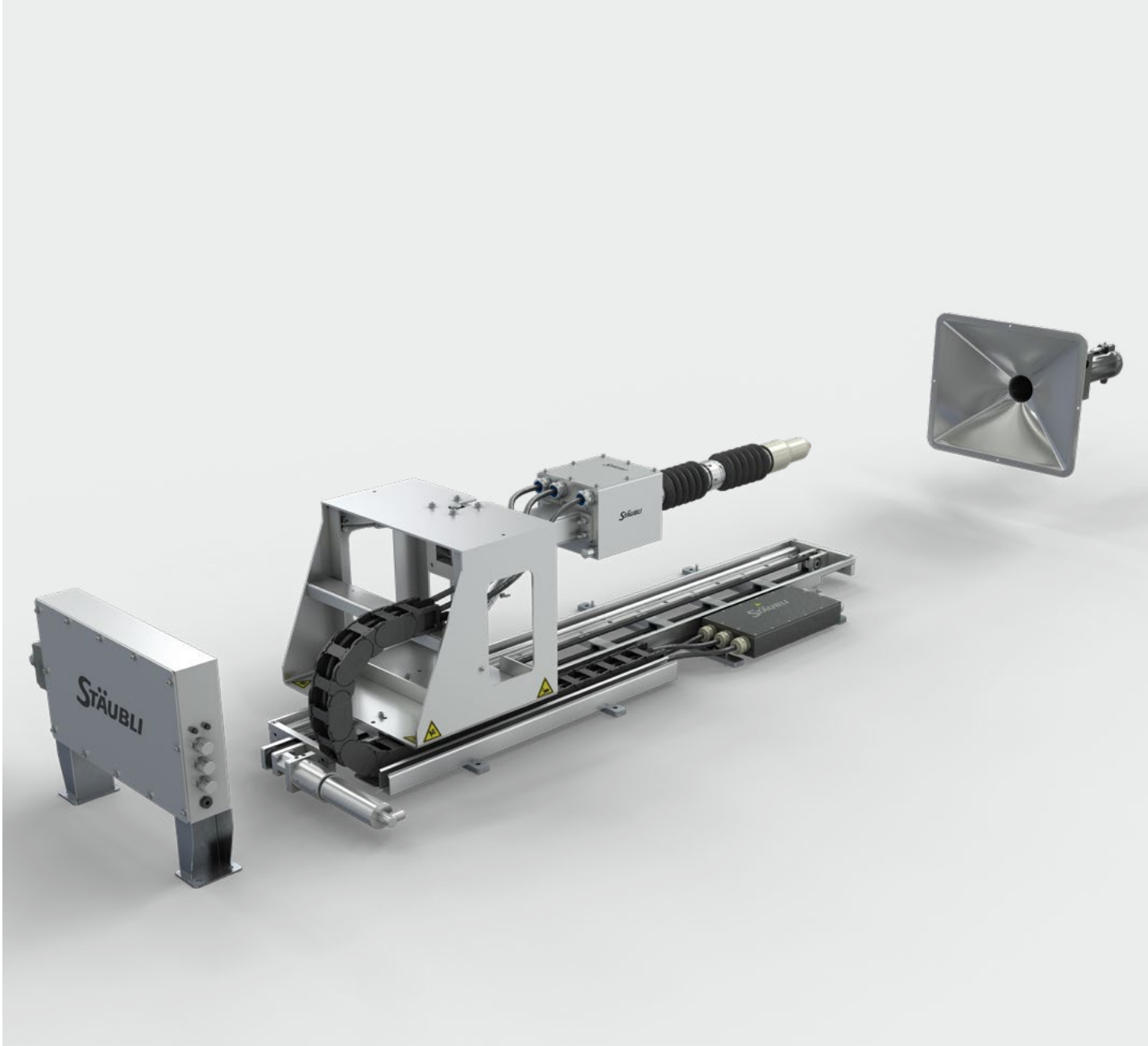
FAST MOVING TECHNOLOGY

Automatic rapid charging connector QCC

Application | Special Catalog

EN



INTRODUCTION

Automatic rapid charging connector

With the connector for rapid charging systems, Stäubli offers an automatic charging option for various commercial vehicles:

- Buses
- Mining equipment
- Trains
- Container transport vehicles
- Automated guided vehicles (AGVs)
- Utility tractor rigs (UTRs)
- Vessels
- Agricultural Equipment
- and more

The automated connection device (ACD) enables high power transmission for fast recharging energy storage devices such as Li-ion batteries and supercapacitors.
The QCC Automated Connection Device (ACD) enables high power transmission for various fast recharging energy storage devices; such as,Li-ion batteries and supercapacitors. This facilitates transportation tasks which are efficient, quiet and emission-free. Additionally, it eliminates the need to integrate a large, heavy, and costly battery. Since less stored energy is required, recharging only involves short interruptions with no negative impact on operation.

Automated charging gives the user additional comfort as he can stay inside the vehicle without the need to plug in manually. It also adds an extra level of protection by reducing the risk of misuse and damage of handheld connectors and the hazard potential linked to such damages.
Furthermore, automated charging will become more and more important in the future, as the degree of automation and number of autonomous vehicles increases. With QCC, Stäubli offers a versatile solution that combines high charging power with a high degree of safety.

An overview of the benefits:

A reliable, fully automated solution

- Designed to absorb both angular and positional misalignment
- No expensive position measuring and position compensation elements necessary

Highly cost-effective

- Designed for a large number of mating cycles, allowing long maintenance intervals
- Minimum contact resistance guarantees high efficiency

Excellent safety features

- Complete touch protection
- First mate last break feature of ground contact
- Design ensures the correct contact sequence and provides an additional limit switch to eliminate the risk of electrical arcs

Protection from environmental influences

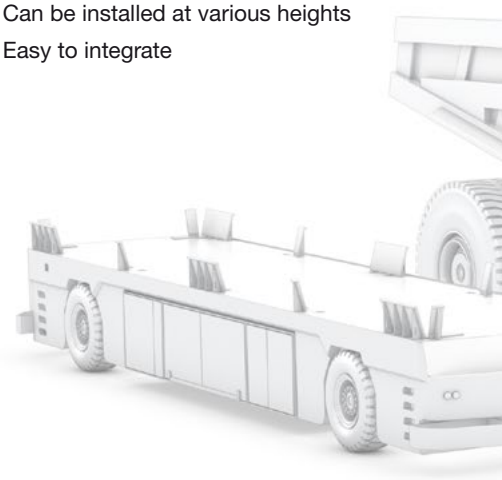
- Ingress protected before, during and after mating
- Features self cleaning MULTILAM contact technology
- Optional pneumatic self-cleaning feature can send a burst of air through the socket to remove any debris

Low space requirement

- Connection can be made from any side of the vehicle at any height
- No need to build a high charger mast reaching over the vehicle or roadway
- For buses: direct integration into bus stop roof is possible
- Sleek design is aesthetically pleasing and easy to incorporate into both infrastructure and vehicle

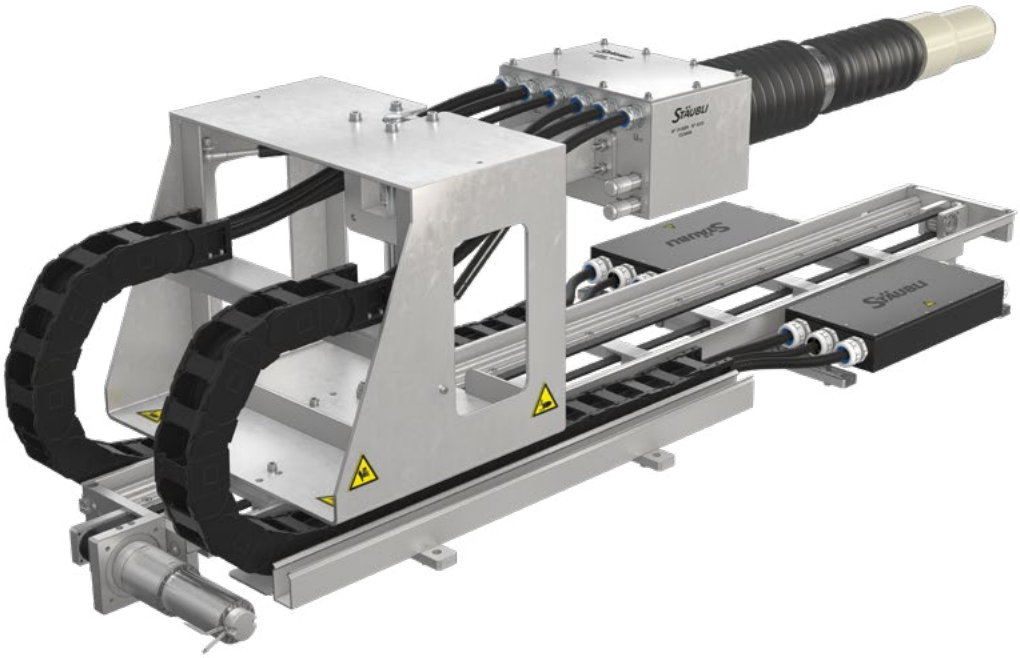
Compact, flexible use

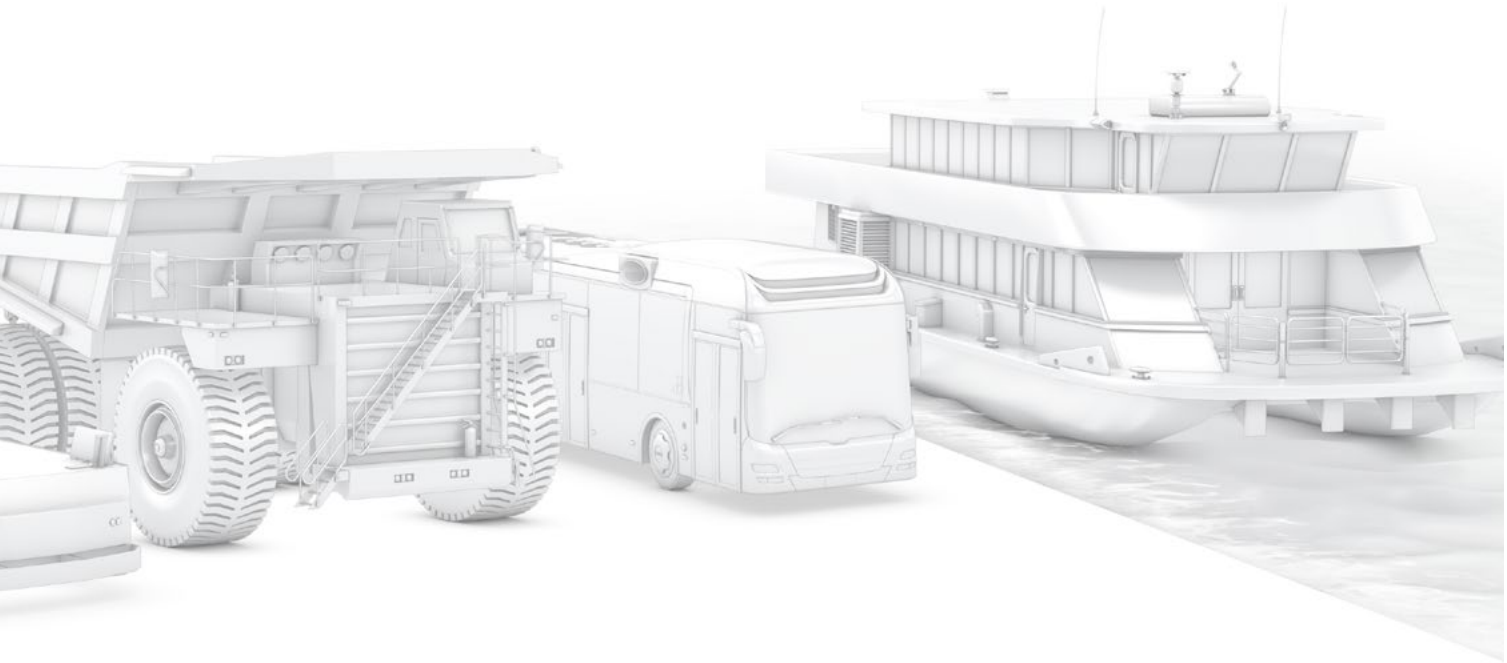
- Can be installed at various heights
- Easy to integrate



The QCC system – greater safety comes standard

Protection against injury is important. Therefore, our systems not only have complete touch protection to eliminate the risk of electric shock, but also come standard with a so-called “safe mode”. In this mode, the plug extension force is reduced until the plug is actually within the socket; only then is the full contact force exerted. If anyone or anything accidentally ends up in the space between the vehicle and the charging station, this prevents damage/injury.

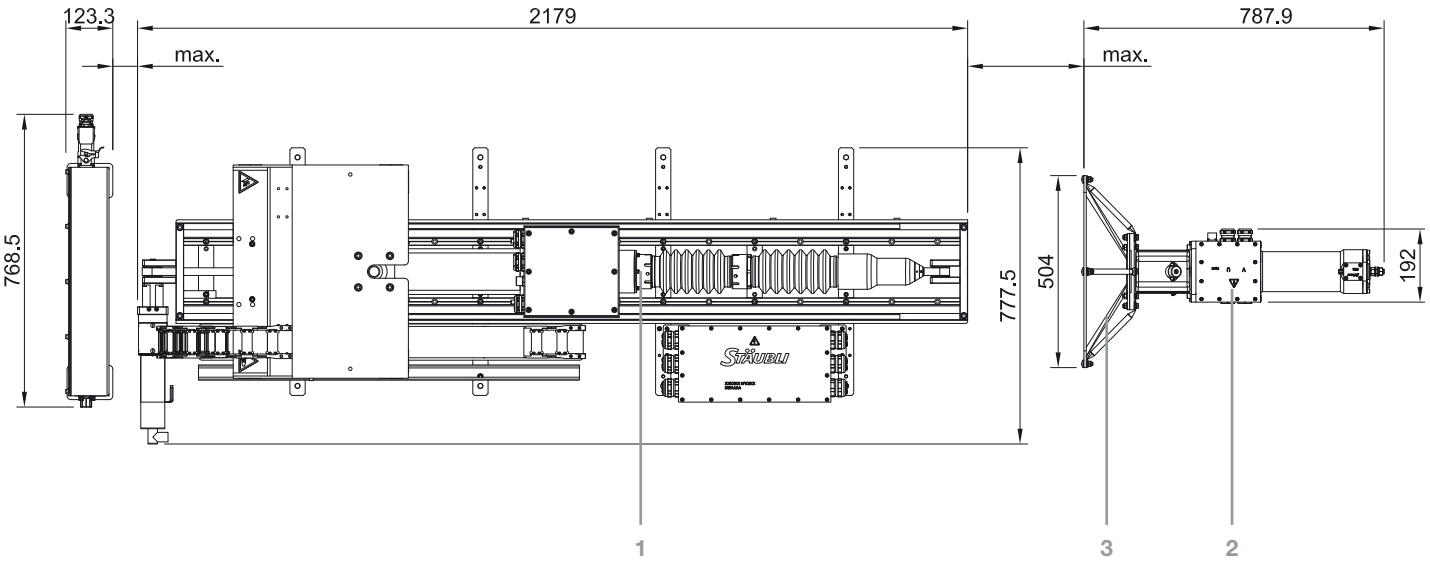




SIZE 2

QCC2

Ideal for most applications.



MA

Assembly instructions MA415

www.staubli.com/electrical

Pos.	Order No.	Type	Name
1	**19.8087**	QCC2-ACD	QCC2 automatic rapid charging connector
2	**19.8083**	QCC2-S50	QCC2 socket
3	**19.8094**	QCC2-FN-500X400-KIT	QCC2 funnel kit, 500 mm x 400 mm

Technical data		
Rated voltage	DC 1500 V	
Overvoltage category	CATIII	
Current* at 15% duty cycles (20-minute intervals)	640 A	for example: 640 kW @ DC 1000 V 960 kW @ DC 1500 V
Degree of pollution	3	
Rated current[1)]	315 A[1)]	for example: 315 kW @ DC 1000 V 472 kW @ DC 1500 V
Lower and upper limit temperature	Ambient temperature range: Below 0 °C: Above 40 °C:	0 °C .... 40 °C with additional heating system possible with reduced current (see page 11)
Protection type – plugged in	IP55/IP2X	
Protection type – unplugged	IP55/IP2X	
Number of power contacts	2 + PE	
Number of signal contacts	5	
Mating cycles	100 000[2)]	
Standards	SAE J3105 SAE J3105/3 NRTL approval pending IEC 61851-23	

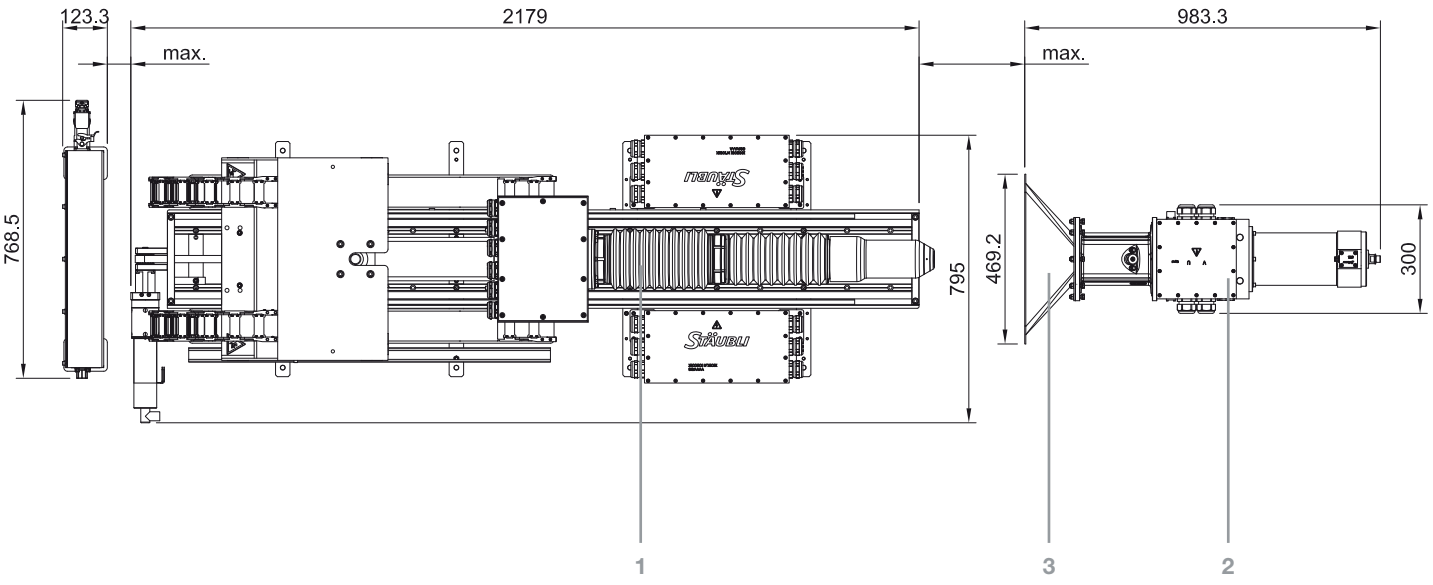
[1)] Detailed information on current and duty cycles on pages 10 – 11

[2)] Depending on environment; more cycles possible with maintenance, see MA415

SIZE 3

QCC3

The most powerful version of the automatic charging plug.



MA

Assembly instructions MA415

www.staubli.com/electrical

Pos.	Order No.	Type	Name
1	**19.8088**	QCC3-ACD	QCC3 automatic rapid charging connector
2	**19.8081**	QCC3-S85	QCC3 socket
3	**19.8059**	QCC3-FN-290X290-KIT	QCC3 funnel kit, 290 mm x 290 mm
	19.8078	QCC3-FN-528X355-KIT	QCC3 funnel kit, 528 mm x 355 mm
	71045404	QCC3-ACD	QCC3 automatic rapid charging connector with temperature sensor and contacts for auxiliary power transmission
	71045401	QCC3 socket	QCC3 socket with temperature sensor and contacts for auxiliary power transmission

Technical data		
Rated voltage	DC 1500 V	
Current* at 15% duty cycles (20-minute intervals)	1440 A	for example: 1.44 MW @ DC 1000 V 2.16 MW @ DC 1500 V
Overvoltage category	CATIII	
Degree of pollution	3	
Rated current[1)]	670 A[1)]	for example: 670 kW @ DC 1000 V 1 MW @ DC 1500 V
Lower and upper limit temperature	Ambient temperature range: Below 0 °C: Above 40 °C:	0 °C .... 40 °C with additional heating system possible with reduced current (see page 11)
Protection type – plugged in	IP55	
Protection type – unplugged	IP55	
Number of power contacts	2 + PE	
Mating cycles	100 000[2)]	
Standards	SAE J3105 SAE J3105/3 NRTL approval pending IEC 61851-23	

[1)] Detailed information on current and duty cycles on pages 10 – 11

[2)] Depending on environment; more cycles possible with maintenance, see MA415

ACCESSORIES

Temperature sensor and auxiliary power

Temperature sensor

PT1000 Class B (EN60751)
The temperature sensor allows temperature monitoring of the contact

Above the optimum QCC operating temperature of 90 °C, the current should be reduced according to the derating curve (see page 10); if it reaches 105 °C, the current should be completely shut off.

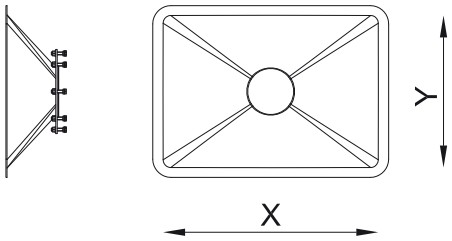
Auxiliary energy

Two signal contacts can be converted into contacts for auxiliary power transmission (up to DC 30 V and 10 A each).

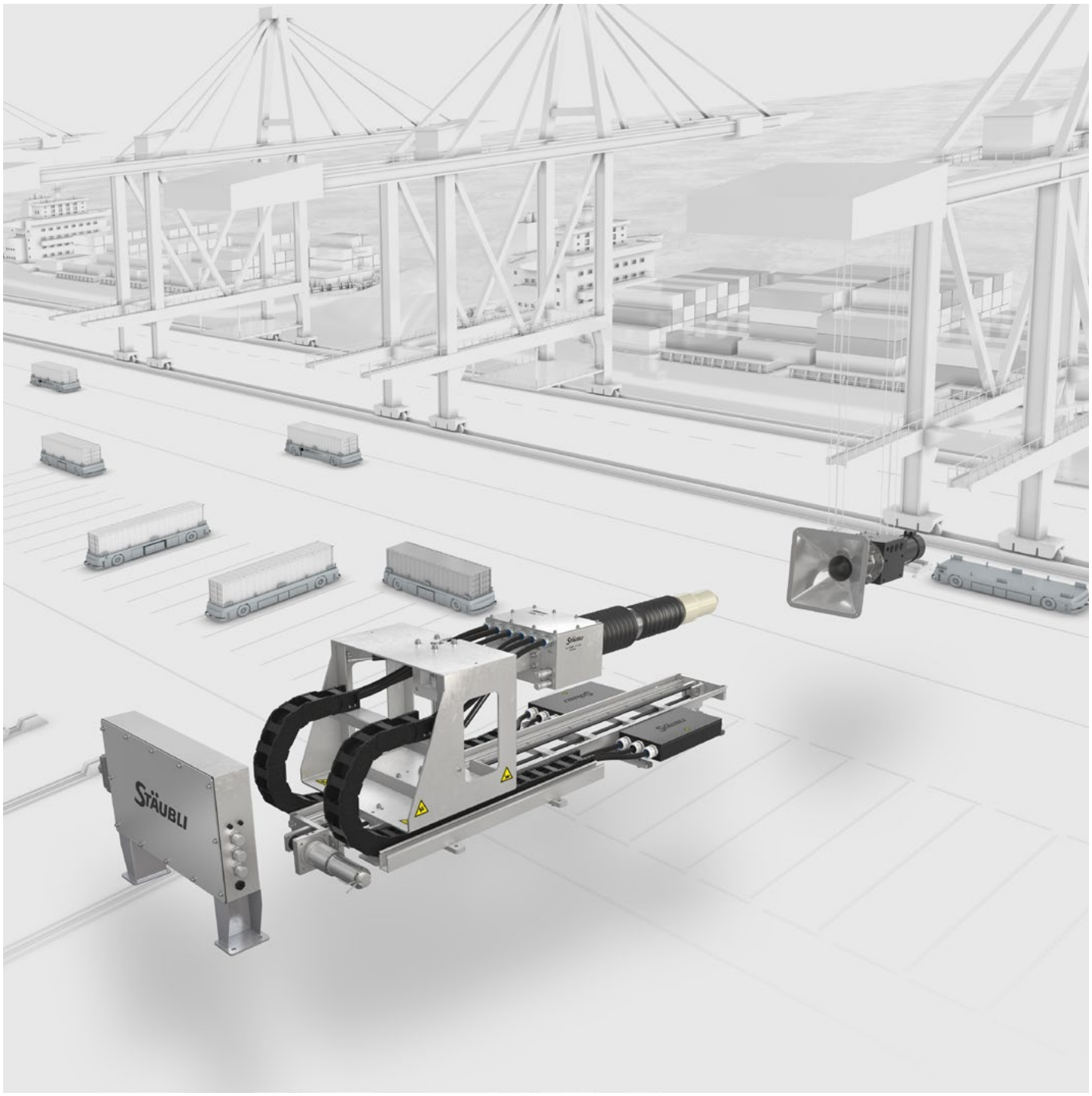
Input funnel

The size of the input funnel is crucial to determining the possible tolerance compensation, and thus the required positioning accuracy of the vehicle relative to the charging station.

QCC3 funnel kit



Order No.	Description	External dimensions in mm		Tolerance compensation in mm		Material
		x	y	x-axis	z-axis	
19.8094	QCC2 funnel kit, 500 mm x 400 mm	604	504	±250	±200	Stainless steel
19.8078	QCC3 funnel kit, 528 mm x 355 mm	644	469	±250	±180	
19.8059	QCC3 funnel kit, 290 mm x 290 mm	400	400	±150	±150	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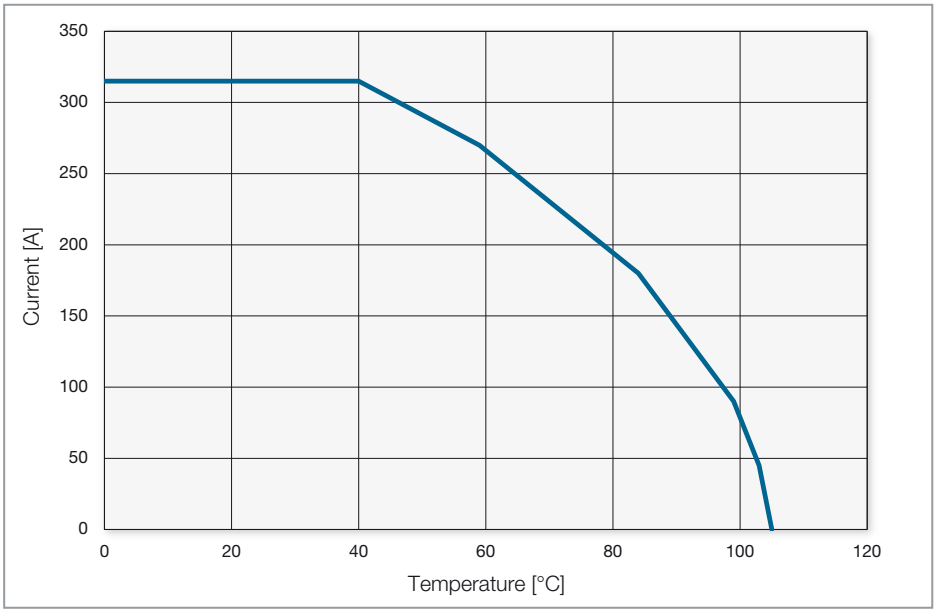
Derating diagrams

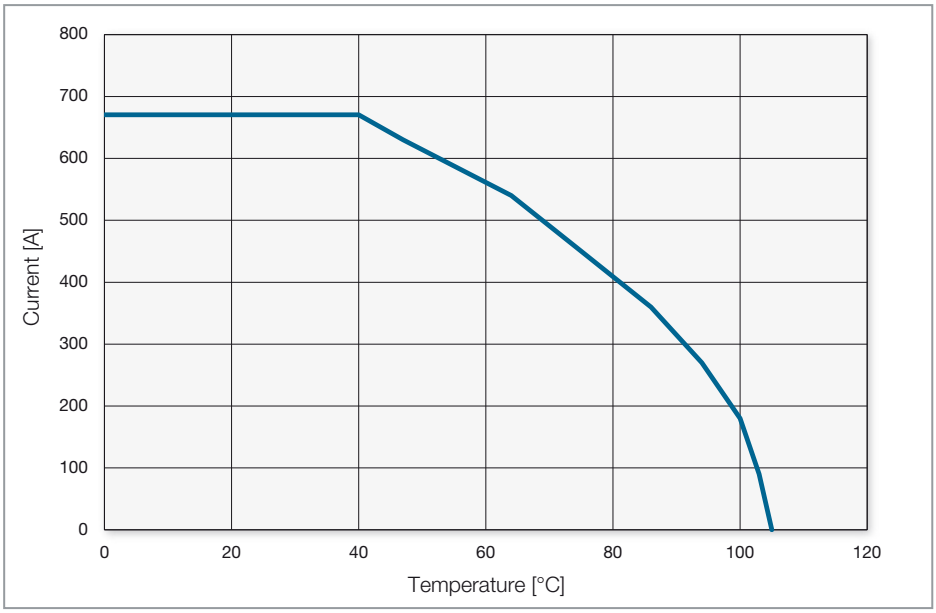
The following derating curves are based on tests per IEC 60512-5-2 and include appropriate safety factors for use at different temperatures as indicated.

According to IEC 61984 and IEC 60512-5-2 (with a correction factor of 0.9).

QCC2 derating diagram

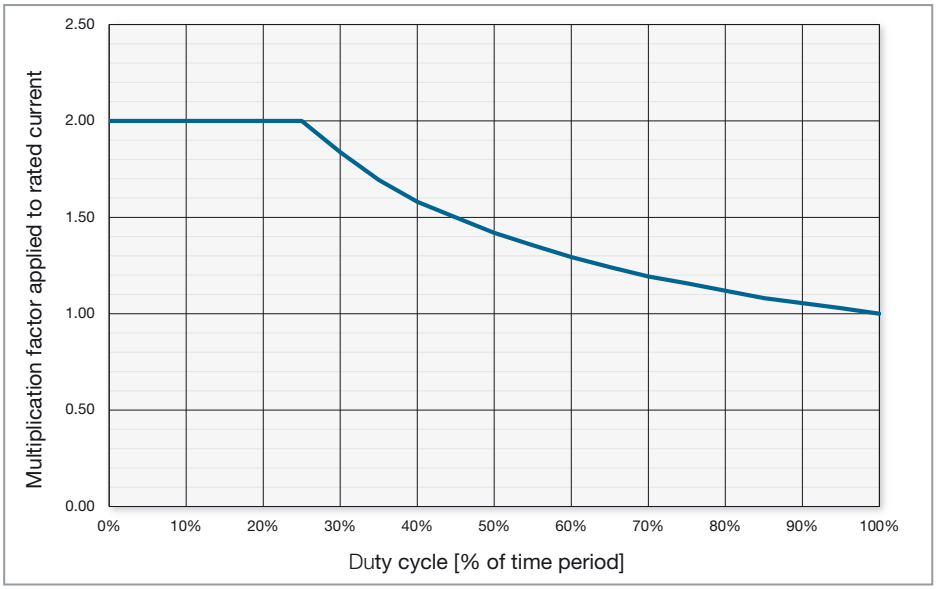


QCC3 derating diagram

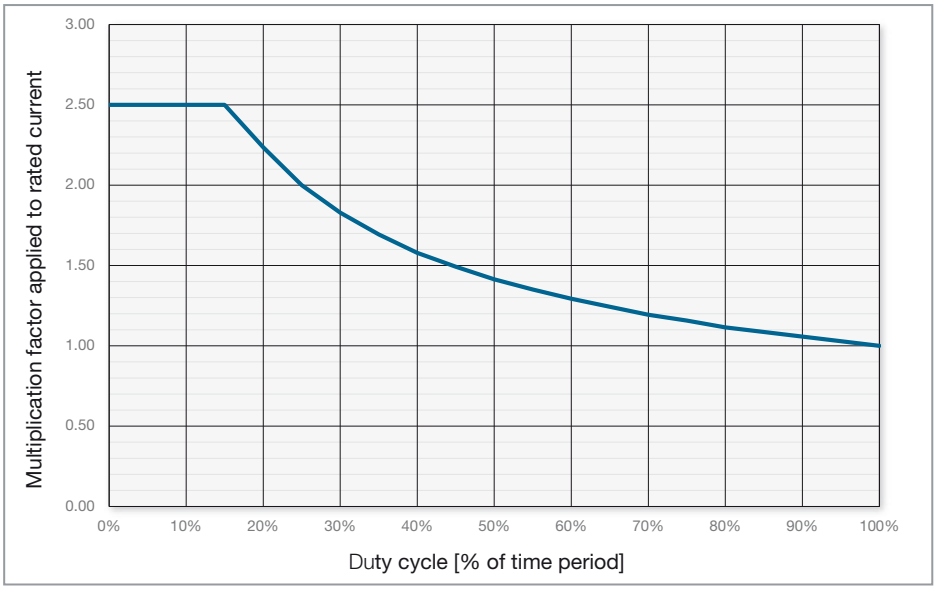


Example of a 20-minute cycle with max. ambient temperature of 40 °C (for further calculations, please contact Stäubli).

QCC2 duty cycles



QCC3 duty cycles



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Global presence of the Stäubli Group

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