

# Tailored Innovations

eMobility Systems



# CUSTOMISED SYSTEM SOLUTIONS FOR YOUR EMOBILITY APPLICATIONS

As an international expert and project partner in system assemblies with many years of experience, extensive development skills as well as a wide range of connection systems and branded products, Lapp is a sought-after partner for innovative system solutions.

We manufacture customised configurable charging systems with various cable types and connector systems for your eMobility applications as well as tailored high-voltage cables and specialised system connections for your energy storage.

As your supply chain partner, Lapp offers you everything from a single source – from advice to project management and engineering through to production, testing, logistics and after-sales services. As an ISO TS 16949 certified company, we are a reliable partner for the automotive and supplier industry.



# FROM THE CHARGING PLUG TO ENERGY STORAGE – LAPP PROVIDES EVERYTHING FROM ONE SOURCE

- Consultation
- Project planning
- Engineering
- Documentation
- Production
- Testing
- Quality assurance
- Logistics
- After-sales services

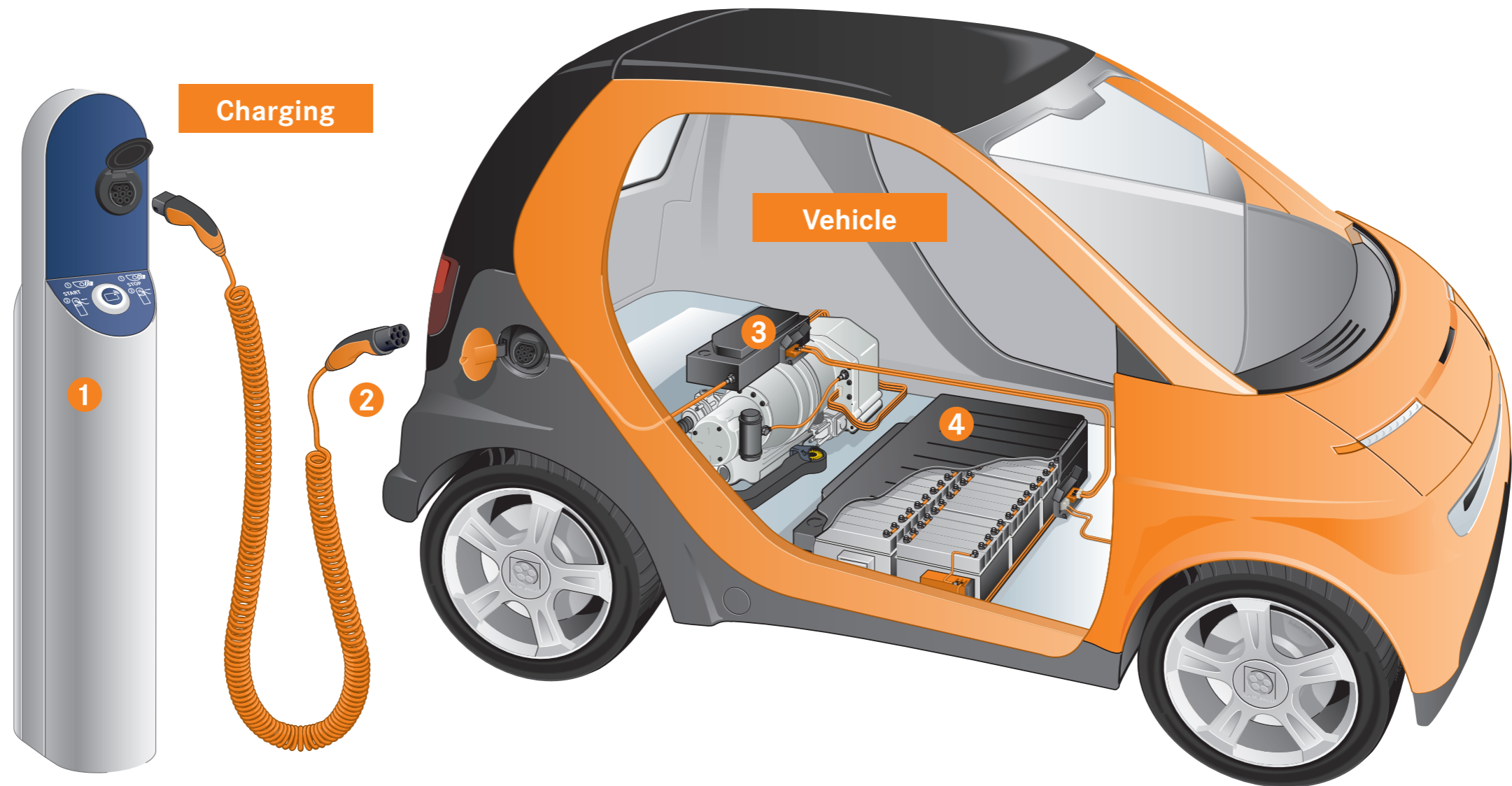


# OUR SOLUTIONS FOR YOUR EMOBILITY APPLICATIONS

In addition to products for your charging infrastructure, we develop and manufacture high-voltage and battery cabling for your eMobility applications.

We can supply charging systems for your charging infrastructure that are individually adapted to your needs. Smooth and spiralsided cables or helixes that roll back up after use – various charging cables are supplied complete with connectors for all standards, charging modes and various design variants. The ability to integrate an RFID-chip into the connector system as an optional extra complements the functionality of your charging system.

The high-voltage cables inside the vehicle can be manufactured for customised assemblies. Lapp offers its own patented connection options for this in addition to the commercially available connections. We make specialised system connections for energy storage applications that are now being used in vehicles made by renowned OEMs.



## 1 CHARGING STATIONS

- Charging sockets and CP modules in a range of designs (on request)
- ÖLFLEX® CLASSIC power and control cables for diverse applications
- Single cores for control cabinets
- ÖLFLEX® SPIRAL spiralsided power cables
- UNITRONIC® data communication systems

- ETHERLINE® data communication systems for ETHERNET technology
- SKINTOP® cable glands
- Ground straps
- FLEXIMARK® single core markings, wraparound labels, labelling systems

## 2 CHARGING CABLE AND CONNECTOR SYSTEMS

- All charging modes
- All standards (Type 1, 2, 3, GB)
- Customised design for the connector systems
- DESIGN and HEAVY DUTY lines
- Optional integration of an RFID-chip

- Various cable types (HELIX, spiral, smooth)
- ÖLFLEX® CHARGE cables
- All products are certified in accordance with the latest standards

## 3 HIGH-VOLTAGE CABLING

- ÖLFLEX® FD 90 CY highly flexible, screened single core cables
- ÖLFLEX® HEAT cables with a wide temperature range
- Customised cables and connectors

## 4 BATTERY CABLES

- Customised connectors and cables

# Innovations made by Lapp

THE RIGHT SOLUTION FOR ALL  
AREAS OF APPLICATION



## >> DESIGN

With the new DESIGN line, Lapp has developed a connector system that is even better at fulfilling our customers' design requirements.

The DESIGN connector's housing consists of three shells, enabling customised design variations in all colour combinations. Using your corporate colours and your logo guarantees consistent implementation of your corporate design, so the charging system will become an integral part of your electric vehicle.

The light material and slim shape of the DESIGN connector makes it ideal for everyday use in the private sector.

## >> HEAVY DUTY

The robust HEAVY DUTY line is suitable for particularly demanding professional applications, e.g. public charging stations, carsharing or parcel services.

The connector, which is made of solid material and is directly injection moulded, consists of a hard component in the connector and a soft component around the handle and anti-kink protection, which creates a secure grip in these areas.

The HEAVY DUTY connector is hazard-free, even under extremely high levels of stress. This reduces your maintenance and service costs.

Customised colours and logos can also be used on the HEAVY DUTY line.



# Innovations made by Lapp

## >> RFID INSIDE

Another innovation by Lapp is the charging plug with an integrated RFID-chip that can store customer-specific data and sign in to the charging point via radio.

Customers have the option of placing the millimetre-thin radio chip, which is clearly identifiable, directly under the logo. This enables accurate data to be registered, e.g. which users are charging when and where and how much power is consumed in the process.



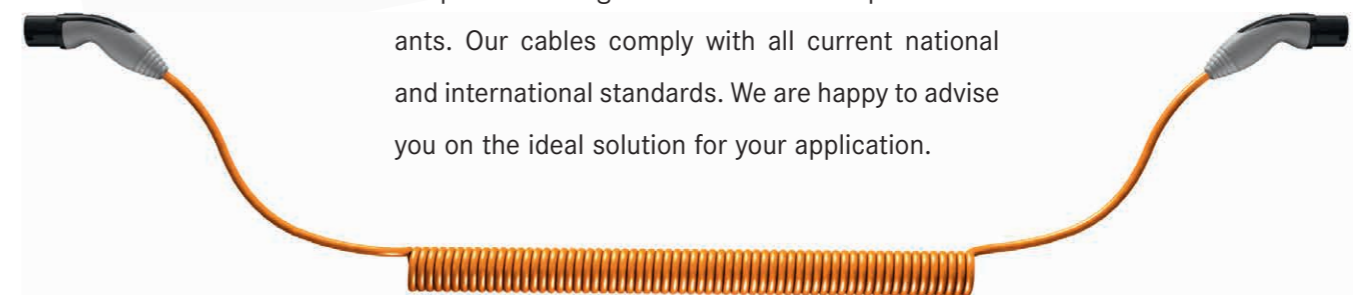
## >> HELIX

The patented LAPP HELIX is a spiralsised quick-charge cable that rolls back up to automatically take its original shape after charging is complete. As such, users don't have to spend time rolling it up by hand – the HELIX is quick and safe to store away.

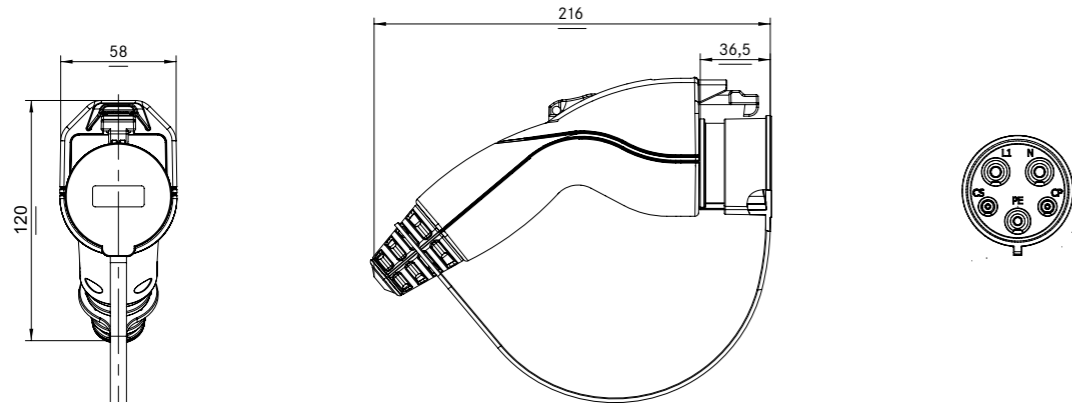
The HELIX is 40 percent lighter than standard coiled cables with the same usable length, thus making it even easier to handle.



Lapp charging cables are also available in a smooth or spiralsised design and in a number of power variants. Our cables comply with all current national and international standards. We are happy to advise you on the ideal solution for your application.



# LAPP CHARGE CHARGING SYSTEM COUPLING TYPE 1 · DESIGN LINE



The LAPP CHARGE charging cable with coupling type 1 in accordance with IEC 62196 and SAE J1772 is a connector for charging electric vehicles that establishes the connection between the charging plug on the electric vehicle and the charging cable set.

The contact area to the control lever is sealed using a two-chamber system. Customised colour requests and customer logos can be taken into consideration here. Standard colours: orange/black. Dust cap is included.

**Optional:**  
Customer logo,  
RFID-chip

## Variants

- 1 phase 20 A - type LC1-KU201, power cores 2.5 mm<sup>2</sup> or AWG 12
- 1 phase 32 A - type LC1-KU321, power cores 6 mm<sup>2</sup> or AWG 10  
Control core: 0.5 mm<sup>2</sup> or AWG 18

## Electrical properties

Assembly (contacts) 1 phase	L1, L2/N, PE, CS, CP
Current in the power contacts	20 A (L1, L2/N, PE)
Current in the power contacts	32 A (L1, L2/N, PE)
Current in the control contacts	2 A (CS, CP)
Rated operating voltage	
Power contacts	250 VAC
Rated operating voltage	
Control contacts	30 VDC
Isolation voltage	500 V

Contact resistances reduced by more than the standard requirement through optional soldering of the power contacts

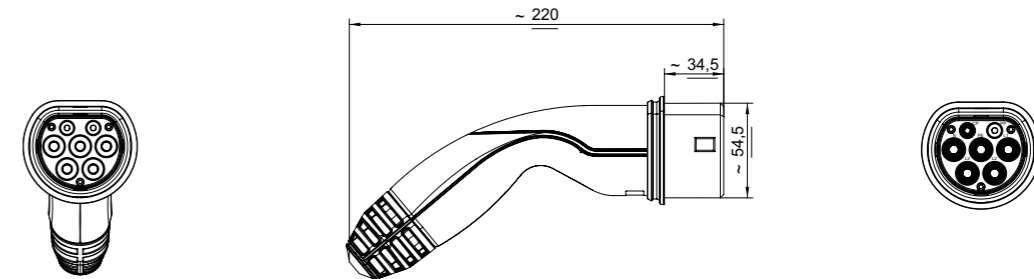
## Mechanical properties

Power contacts L1, L2/N	Lamella contacts silver-plated Cu, crimp termination
Power contacts PE	Slotted contacts silver-plated Cu, crimp termination
Power contacts CS, CP	Slotted contacts silver-plated Cu, crimp termination
Material housing	Reinforced thermoplastic moulding material

## General properties

Duration	20,000 cycles of mechanical operation in accordance with IEC 62196-1 (without load)
Protection rating in accordance with IEC 60529	IP44 (mated or unmated with dust cap)
Protection rating in accordance with UL 2251	3S in accordance with UL 50E
Operating temperature range	-30 °C to + 50 °C
Standard	IEC 62196 and UL 2251 - SAE J1772
Approvals	CE-compliance, VDE-certified, UL/CSA approval pending, PSE approval pending

# LAPP CHARGE CHARGING SYSTEM COUPLING TYPE 2 · DESIGN LINE



The LAPP CHARGE charging cable with coupling type 2 is a connector for charging electric vehicles that establishes the connection between the charging plug on the electric vehicle and the charging cable set. The three-part shell construction means that various colour variants can be taken into consideration if customised colours are requested. Standard colours: orange/black. Dust cap is included.

**Optional:**  
Customer logo,  
RFID-chip

The slim design used for all connector types guarantees ergonomic use.

## Variants

1 phase 20 A - type LC2-KU201,	Cable 3G2.5+0.5 mm <sup>2</sup> (prEN 50620)
3 phase 20 A - type LC2-KU203,	Cable 5G2.5+0.5 mm <sup>2</sup> (prEN 50620)
1 phase 32 A - type LC2-KU321,	Cable 3G6+0.5 mm <sup>2</sup> (prEN 50620)
3 phase 32 A - type LC2-KU323,	Cable 5G6+0.5 mm <sup>2</sup> (prEN 50620)

## Electrical properties

Assembly 1 phase	L1, N, PE, PP, CP
Assembly 3 phase	L1, L2, L3, N, PE, PP, CP
Current in the power contacts	
Current in the power contacts	20 A (L1, L2, L3, N, PE)
Current in the power contacts	32 A (L1, L2, L3, N, PE)
Current in the control contacts	2 A (CP, PP)
Rated operating voltage	
Power contacts	1 phase 250 VAC/3 phase 450 VAC
Rated operating voltage	
Control contacts	30 VDC (CP, PP)
Isolation voltage	500 V
Coding resistance (between PP and PE)	680 Ω ± 1% (20 A), 220 Ω ± 1% (32 A)

Contact resistances reduced by more than the standard requirement through optional soldering of the power contacts

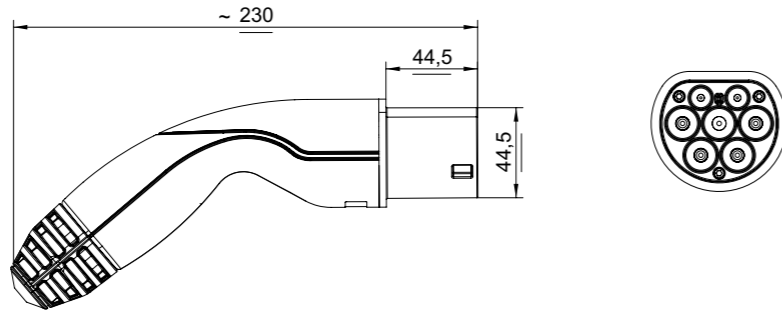
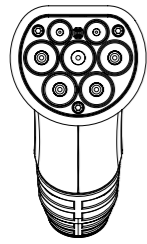
## Mechanical properties

Power contacts (L1, L2, L3, N, PE)	Lamella contacts silver-plated brass
Control contacts (CP, PP)	Lamella contacts silver-plated brass
Material housing	Reinforced thermoplastic moulding material

## General properties

Protection rating	IP44 (mated or unmated with dust cap)
Operating temperature range	-30 °C to + 50 °C
Standard	IEC 62196-1 and IEC 62196-2
Approvals	CE-compliance, VDE-certified

# LAPP CHARGE CHARGING SYSTEM CONNECTOR TYPE 2 · DESIGN LINE



The LAPP CHARGE charging plug type 2 is a connector for charging electric vehicles that establishes the connection between the charging cable set and the infrastructure's charging socket. The three-part shell construction means that various colour variants can be taken into consideration if customised colours are requested. Standard colours: orange/black.

Optional:  
Customer logo,  
RFID-chip,  
Dust cap

The slim design used for all connector types guarantees ergonomic use.

## Variants

1 phase 20 A - type LC2-KU201,	Cable 3G2.5+0.5 mm <sup>2</sup> (prEN 50620)
3 phase 20 A - type LC2-KU203,	Cable 5G2.5+0.5 mm <sup>2</sup> (prEN 50620)
1 phase 32 A - type LC2-KU321,	Cable 3G6+0.5 mm <sup>2</sup> (prEN 50620)
3 phase 32 A - type LC2-KU323,	Cable 5G6+0.5 mm <sup>2</sup> (prEN 50620)

## Electrical properties

Assembly 1 phase	L1, N, PE, PP, CP
Assembly 1 phase	L1, N, PE, PP, CP
Assembly 3 phase	L1, L2, L3, N, PE, PP, CP
Current in the power contacts	20 A (L1, L2, L3, N, PE)
Current in the power contacts	32 A (L1, L2, L3, N, PE)
Current in the control contacts	2 A (CP, PP)
Rated operating voltage	
Power contacts	1 phase 250 VAC/3 phase 450 VAC
Rated operating voltage	
Control contacts	30 VDC (CP, PP)
Isolation voltage	500 V
Coding resistance (between PP and PE)	680 Ω ±1% (20 A), 220 Ω ±1% (32 A)

Contact resistances reduced by more than the standard requirement through optional soldering of the power contacts

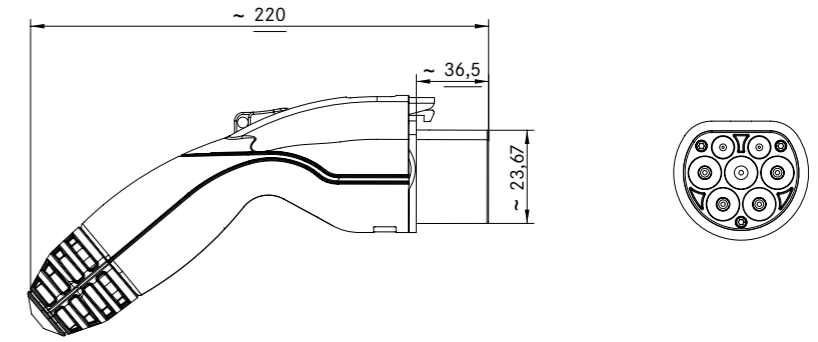
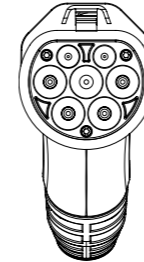
## Mechanical properties

Power contacts (L1, L2, L3, N, PE)	Nickel-plated or silver-plated brass
Control contacts (CP, PP)	Nickel-plated or silver-plated brass
Material housing	Reinforced thermoplastic moulding material

## General properties

Protection rating	IP44 (mated)
Operating temperature range	-30 °C to + 50 °C
Standard	IEC 62196-1 and IEC 62196-2
Approvals	CE-compliance, VDE-certified

# LAPP CHARGE CHARGING SYSTEM CONNECTOR TYPE GB · DESIGN LINE



The LAPP CHARGE vehicle plug type GB is a connector for charging electric vehicles that establishes the connection between the charging cable set and the vehicle's vehicle socket.

A two-chamber system guarantees that the contact area to the control lever is sealed and protects the contact area from the penetration of dust and water (protection rating IP44).

The three-part shell construction means that various colour variants can be used; Standard colours: orange/black.

Optional:  
Customer logo,  
RFID-chip,  
Dust cap

The slim design used for all connector types guarantees ergonomic use.

## Variants

1 phase 20 A - type LC4-STF201,	Cable 3G2.5+0.5 mm <sup>2</sup> (prEN 50620)
3 phase 20 A - type LC4-STF203,	Cable 5G2.5+0.5 mm <sup>2</sup> (prEN 50620)
1 phase 32 A - type LC4-STF321,	Cable 3G6+0.5 mm <sup>2</sup> (prEN 50620)
3 phase 32 A - type LC4-STF323,	Cable 5G6+0.5 mm <sup>2</sup> (prEN 50620)

## Electrical properties

Assembly 1 phase	L1, N, PE, CP, CC
Assembly 3 phase	L1, L2, L3, N, PE, CP, CC
Current in the power contacts	20 A (L1, L2, L3, N, PE)
Current in the power contacts	32 A (L1, L2, L3, N, PE)
Current in the control contacts	2 A (CP, CC)
Rated operating voltage	
Power contacts	1 phase 250 VAC/3 phase 400 VAC
Rated operating voltage	
Control contacts	30 VDC (CP, CC)
Isolation voltage	500 V

Contact resistances reduced by more than the standard requirement through optional soldering of the power contacts

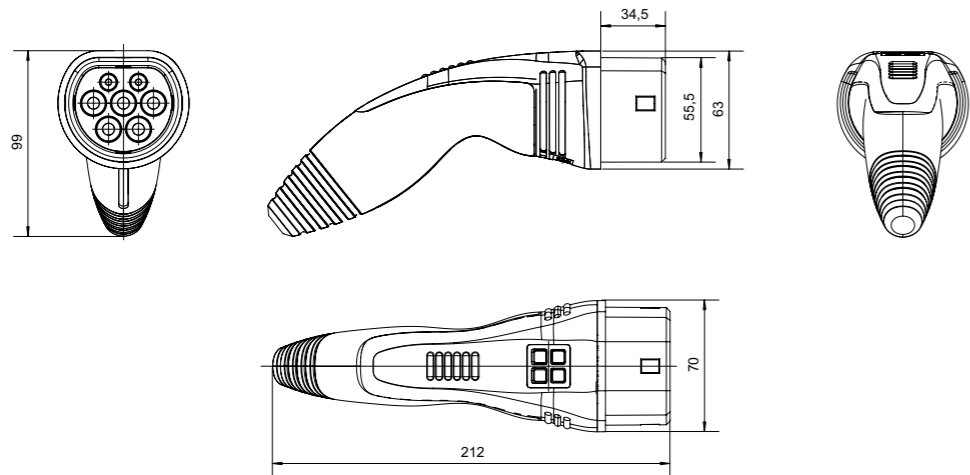
## Mechanical properties

Power contacts (L1, L2, L3, N, PE)	Silver-plated brass, crimp termination, soldered (optional)
Control contacts (CP, CC)	Silver-plated brass, crimp termination, soldered (optional)
Material housing	Reinforced thermoplastic moulding material

## General properties

Duration	20,000 cycles of mechanical operation (without load)
Protection rating in accordance with GB/T 20234.2	IP54 (unmated with dust cap) IP55 (mated)
Operating temperature range	-30 °C to + 50 °C
Standard	GB/T 20234.1 and GB/T 20234.2
Approvals	CQC approval pending

# LAPP CHARGE CHARGING SYSTEM COUPLING TYPE 2 · HEAVY DUTY LINE



The LAPP CHARGE charging cable with coupling type 2 is a connector for charging electric vehicles that establishes the connection between the charging plug on the electric vehicle and the charging cable set. The coupling, which is made of solid material and is directly injection moulded, consists of a black hard component in the connector and a soft component around the handle and anti-kink protection, which creates a comfortable grip in these areas. Customised colour requests can be taken into consideration here. Standard colours: orange (RAL 2003) and grey (RAL 7000). Dust cap is included.

**Optional:**  
Customer logo,  
RFID-chip

There are 1 phase and 3 phase variants available in 20 A (2.5 mm<sup>2</sup>) and 32 A (6 mm<sup>2</sup>).

## Electrical properties

Assembly (contacts) 1 phase	L1, N, PE, PP, CP
Assembly (contacts) 3 phase	L1, L2, L3, N, PE, PP, CP
Current in the power contacts	20 A or 32 A (L1, L2, L3, N, PE)
Current in the control contacts	2 A (CP, PP)
Rated operating voltage	
Power contacts	200/346 V - 240/415 V
Rated operating voltage	
Control contacts	30 V (CP, PP)
Isolation voltage	500 V
Coding resistance (between PP and PE)	680 Ω ± 1% (20 A), 220 Ω ± 1% (32 A)

Contact resistances reduced by more than the standard requirement through optional soldering of the power contacts

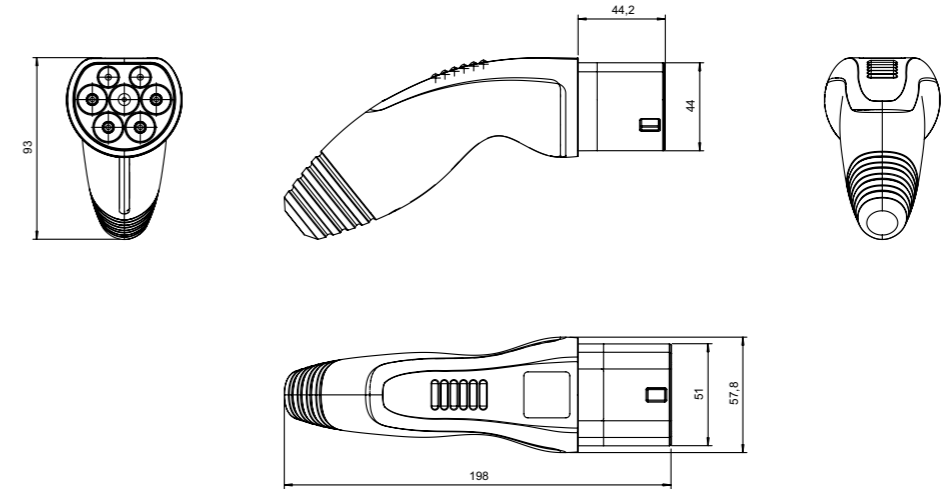
## Mechanical properties

Power contacts (L1, L2, L3, N, PE)	Silver-plated brass
Control contacts (CP, PP)	Nickel-plated brass
Hard components material	PA6 (30% glass fibre filling)
Soft components material (handle area)	TPE

## General properties

Protection rating	IP44 (mated)
Operating temperature range	-30 °C to + 50 °C
Standard	IEC 62196

# LAPP CHARGE CHARGING SYSTEM CONNECTOR TYPE 2 · HEAVY DUTY LINE



The LAPP CHARGE charging plug type 2 is a connector for charging electric vehicles that establishes the connection between the charging plug on the charging infrastructure (charging station) and the charging cable set. The connector, which is made of solid material and is directly injection moulded, consists of a black hard component in the connector and a soft component around the handle and anti-kink protection, which creates a comfortable grip in these areas. Customised colour requests can be taken into consideration here. Standard colours: orange (RAL 2003) and grey (RAL 7000).

**Optional:**  
Customer logo,  
RFID-chip,  
Dust cap

There are 1 phase and 3 phase variants available in 20 A (2.5 mm<sup>2</sup>) and 32 A (6 mm<sup>2</sup>).

## Electrical properties

Assembly (contacts) 1 phase	L1, N, PE, PP, CP
Assembly (contacts) 3 phase	L1, L2, L3, N, PE, PP, CP
Current in the power contacts	20 A or 32 A (L1, L2, L3, N, PE)
Current in the control contacts	2 A (CP, PP)
Rated operating voltage	
Power contacts	200/346 - 240/415V
Rated operating voltage	
Control contacts	30 V (CP, PP)
Isolation voltage	500 V
Coding resistance (between PP and PE)	680 Ω ± 1% (20 A), 220 Ω ± 1% (32 A)

Contact resistances reduced by more than the standard requirement through optional soldering of the power contacts

## Mechanical properties

Power contacts (L1, L2, L3, N, PE)	Nickel-plated brass
Control contacts (CP, PP)	Nickel-plated brass
Hard components material	PA6 (30% glass fibre filling)
Soft components material	TPE

## General properties

Protection rating	IP44 (mated)
Operating temperature range	-30 °C to + 50 °C
Standard	IEC 62196





**ÖLFLEX®**  
Power and control cables



**UNITRONIC®**  
Data communication systems



**ETHERLINE®**  
Data communication systems  
for ETHERNET technology



**HITRONIC®**  
Optical transmission systems



**EPIC®**  
Industrial connectors



**SKINTOP®**  
Cable glands



**SILVYN®**  
Protective cable conduit systems  
and cable carrier systems



**FLEXIMARK®**  
Marking systems

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