

Electromobility

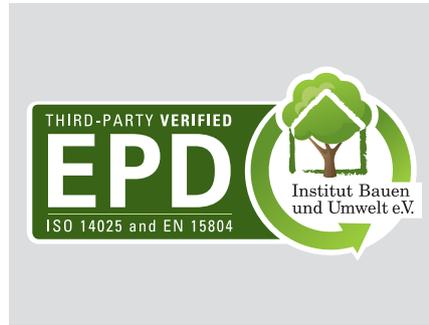
# Competence Brochure



Infrastructure for electromobility



## General information



# Table of contents

<b>Promoting electromobility now to prepare for later</b>	<b>4</b>
<b>EU Building Directive 2018/844</b>	<b>6</b>
<b>Regulations, standards and provisions</b>	<b>7</b>
<b>Good arguments in favour of the eFlex system</b>	<b>8</b>
<b>eFlex configurator: adapter plates for each wallbox</b>	<b>9</b>
<b>eFlex configurator: the stand for today, tomorrow and beyond</b>	<b>10</b>
<b>eFlex product overview</b>	<b>12</b>
<b>Foundations for stands</b>	<b>19</b>
<b>Wiring infrastructure for various applications</b>	<b>22</b>
<b>Everything from a single source</b>	<b>23</b>
<b>Technical basics of charging infrastructure for electromobility</b>	<b>24</b>
<b>Planning principles</b>	<b>26</b>
<b>Charging infrastructure partners for e-mobility</b>	<b>28</b>
<b>Langmatz</b>	<b>28</b>
<b>Günther Spelsberg GmbH + Co. KG</b>	<b>29</b>
<b>DEHN</b>	<b>30</b>
<b>Doepke Schaltgeräte</b>	<b>31</b>
<b>Contact</b>	<b>32</b>
<b>Notes</b>	<b>33</b>



## Promoting electromobility now to prepare for later

### Are you ready for electromobility?

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The EU Building Directive 2018/844 establishes a mandatory charging and wiring infrastructure for electric vehicles in residential and non-residential buildings. The tried-and-tested solutions by FRÄNKISCHE will help users to be well-prepared – from eco-balanced electrical conduits to underground conduits and exposed installations in parking areas.

With our sealing systems, we ensure a safe transition between buildings and charging points.

The new eFlex stands are the ideal demarcation point for the wired infrastructure and the implementation of the building directive.



## Extensive charging infrastructure for electromobility

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With the building directive, provisions for an extensive charging infrastructure for electromobility shall be made to speed up the transition from conventionally to electrically driven vehicles. It includes exact regulations as to when and to what extent wiring infrastructure shall be provided.

### eFlex – the perfect stand for each wallbox

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With eFlex, we offer a system solution for the charging infrastructure of electric vehicles. The modular stands form the intelligent demarcation point of the wiring infrastructure and connect directly to the underground conduits. They are used for the manufacturer-independent installation of wallboxes and cover parking space situations from one to four vehicles.

The removable disc system offers the greatest possible flexibility: Most common wallbox models fit on the specially manufactured eFlex Carrier, thanks to the predetermined hole pattern. Additionally, our Multi Carrier can be individually adapted to other wallboxes. If the parking spaces are supposed to be retrofitted with a charging point, it works as a cover to seal the unused connections and can also be subsequently provided with an individual hole pattern.

The stands also offer space for distributors. This means that you can integrate additional components such as circuit breakers, lightning and surge protection, meters and IT technology. They are accessible via an inspection cover whenever necessary.

All eFlex components are cathodically dip-coated and have a particularly high-quality powder coating. This makes the stands especially corrosion-resistant and offers increased protection against mechanical stresses such as stone impacts.

The different variants eFlex Basic I, Basic II, Advanced and Comfort are optionally also available as "Top" designs with roof, lighting and twilight sensor.



eFlex Comfort Top with Multi Carrier



## EU Building Directive 2018/844

### New buildings

The following applies to new buildings:

- For **residential buildings** from 11 parking spaces, every parking space must be provided with a prepared conduit connection.



- For **non-residential buildings** from 11 parking spaces, every fifth parking space must be provided with a prepared conduit connection.



This wiring infrastructure makes sure that charge points can be added whenever they become necessary.

**Non-residential buildings must be additionally equipped with at least one charge point ready for operation.**



## Renovations

The specifications regarding renovations are the same as for new buildings as per European specifications, i.e., from 11 parking spaces ...

- in residential buildings, every single parking space ... must be provided with wiring infrastructure.
- in non-residential buildings, every fifth parking space

**Non-residential buildings must be additionally equipped**

**with at least one charge point ready for operation.**

### Existing buildings

As of 01 January 2025, existing non-residential buildings with more than 20 parking spaces must be provided with at least one charge point per building. Conduits provide for the appropriate wiring infrastructure in this case as well.

## Regulations, standards and provisions

### Planning principles of electrical installations in flats

Experts specify one feed line for one charging facility, designed for the continuous current carrying capacity of at least 32 A, from the main distribution board and/or meter box to the charging station.

To avoid considerable follow-up costs, it is recommended that at least one corresponding electrical conduit for accommodating this line should be included already when planning new buildings. In addition to this, a separate electrical conduit for a communication line, for example, a network line to the charging station, shall be installed to connect the charging station for future applications in a smart home and/or power network.

### Registration of charging facilities

As per the Low voltage connection directive (*Niederspannungsanschlussverordnung – NAV*), charging facilities shall be generally reported to the network operator prior to putting into operation. If the connected load is above 12 kVA, they require the network operator's approval.

#### Note

##### **Forward-looking planning is necessary to meet future demands.**

Large dimensioning of respective feed lines, distributors and other components can help prevent high subsequent costs. A flexibly adjustable solution can be created with a suitable infrastructure.

Although the directive does not stipulate an obligation for single- and two-family homes, we still recommend providing an infrastructure of prepared conduits already in the planning stage.

## Good arguments in favour of the eFlex system

Challenge: unknown usage behaviour / unknown parking situation at the time of planning

**FRÄNKISCHE** solution: flexible and expandable eFlex system

### Flexibility

- No uncertainties during planning since it is compatible with each wallbox
- Individual wallbox equipment possible for each fixing point
- Unused fixing points can be sealed using eFlex Multi Carrier
- Suitable design for any parking space situation
- Infrastructure components in the product range: cable conduits with sealings and foundation solutions

### Sustainability

- High-quality and durable stands MADE IN GERMANY
- Corrosion-resistant thanks to cathodic dip-coating and powder coating
- Future generations of wallboxes can be attached as well

### Adapted to requirements

- Integration of distribution boards for meters and safety devices as well as IT equipment possible
- Optionally available as Top design: Equipped with roof, lighting and twilight sensor, the stand is visible any time and provides protection against frost and weather influences.

### Future potential

- Free fixing points can be extended with wallboxes at any time if requirements change
- The stand can be easily retrofitted with eFlex Top
- Thanks to the modular system, you only need a few components to change the stand model. eFlex Basic, for example, can be converted into eFlex Advanced or Comfort.

Challenge: setup of many charge points in a short time

**FRÄNKISCHE** solution: simple installation, modular eFlex system

- Integrable distributor for additional functions
- Looping-through of supply lines reduces installation effort and costs

Challenge: a stand for each wallbox manufacturer and/or for each wallbox model

**FRÄNKISCHE** solution: eFlex system with adapter plates

Suitable for all wallboxes

- eFlex Carriers are suited for the most commonly used wallbox models irrespective of the manufacturer
- eFlex Multi Carrier for the individual adjustment to many wallboxes

Simple storage and a streamlined product range

- Only the eFlex system, no need to store many manufacturers, high availability from FRÄNKISCHE stock
- Reduction of storage capacities and thus reduction of costs

## eFlex configurator: adapter plates for each wallbox

### TO BE ORDERED SEPARATELY!

1x per wallbox

#### Carrier

Dip-coated and powder-coated steel plate with pre-fabricated hole pattern for the following wallbox models:

#### Manufacturer Type / Model

- |   |   |
|---|---|
| ■ MENNEKES (AMTRON)                                       | ■ Heidelberg (Energy Control / Home Eco / connect)      |
| ■ Spelsberg (Pure / Smart Pro)                            | ■ ABB (Terra AC)  |
| ■ Spelsberg eBike (BCS)                                   | ■ WALTHER-WERKE (smartEVO) <sup>a</sup>                 |
| ■ Hager (witty start / flow / share / solar) <sup>a</sup> | ■ KATHREIN (KWB-AC40) <sup>a</sup>                      |
| ■ KEBA (KeContact P30)                                    | ■ PRACTH (ALPHA) <sup>a</sup>                           |
| ■ ABL (eMH2 / eMH3)                                       | ■ Compleo (eBOX professional + eBOX smart) <sup>a</sup> |
| ■ ALFEN (Eve Single Pro)                                  | ■ More models in preparation                            |



<sup>a</sup> = available on request

Your model is not listed or you have an unoccupied fixing point?

### USE OUR MULTI CARRIER!

#### Multi Carrier

Dip-coated and powder-coated stainless steel plate for free hole pattern design up to max. 230x445 mm or for use as a cover for unoccupied wallbox spaces.

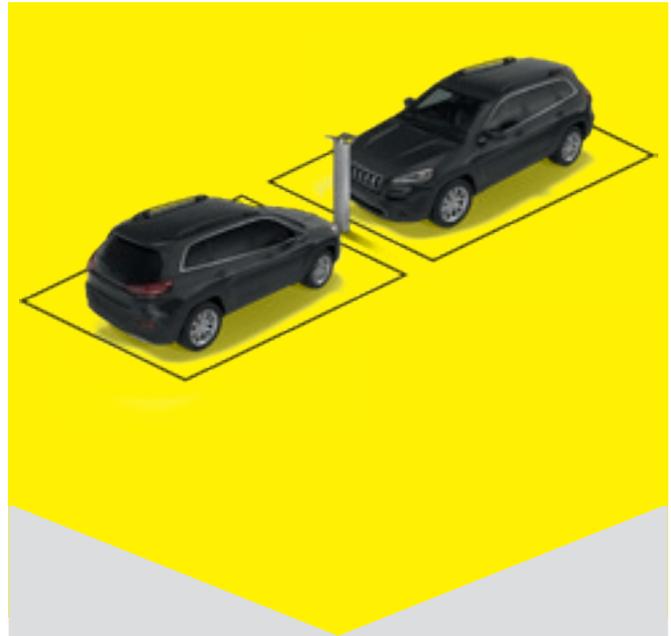


# eFlex configurator: the stand for 10 day, tomorrow and beyond



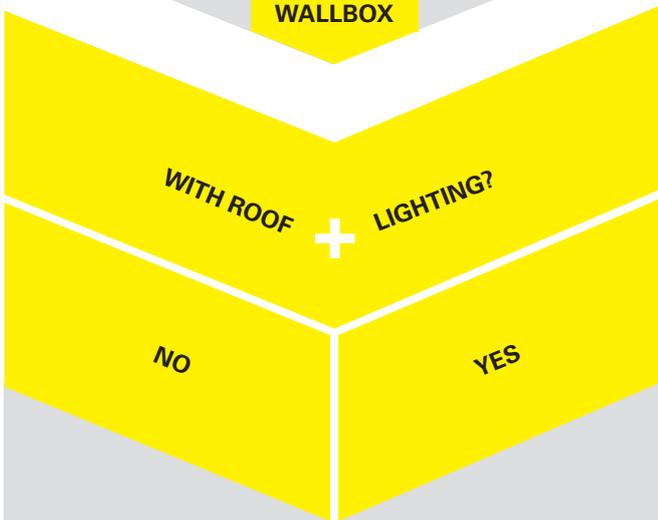
Subsequent expansion to 2 wallboxes is possible at any time. Simply use Multi Carrier or replace by Carrier.

**FOR ONE WALLBOX**



Division between Carrier (carrier plate) for your wallbox model and Multi Carrier for all other models or unoccupied spaces (later expansion).

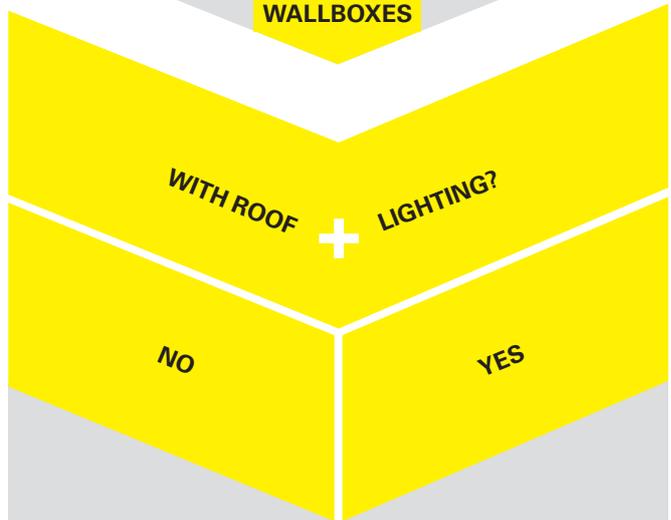
**UP TO 2 WALLBOXES**



**eFlex Basic I**



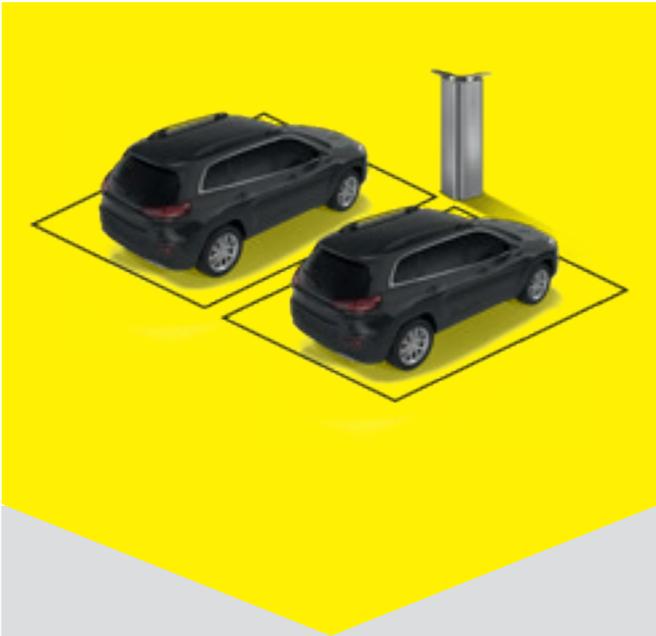
**eFlex Basic I Top**



**eFlex Basic II**

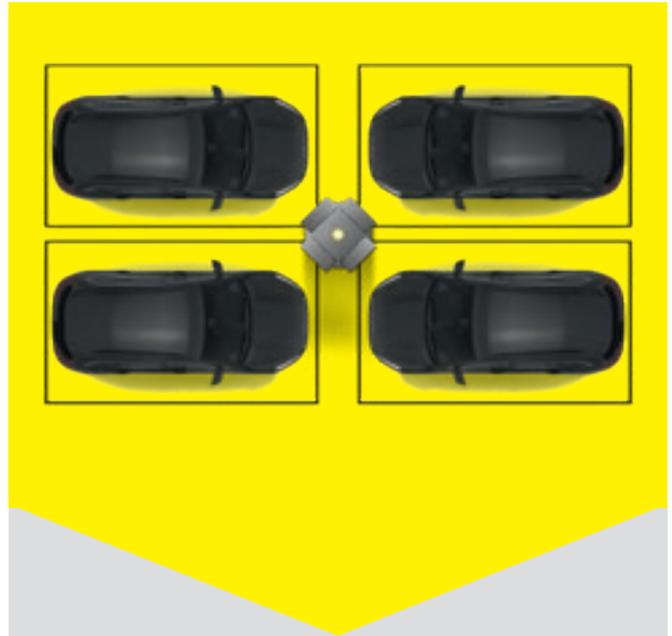


**eFlex Basic II Top**



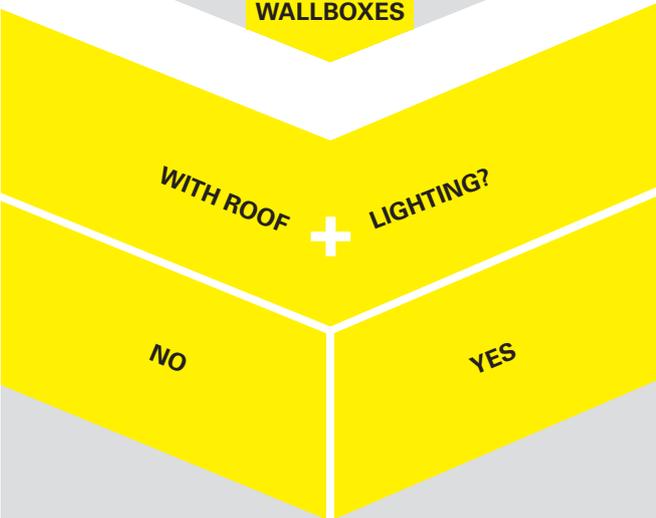
Division between Carriers (carrier plate) for your wallbox model and covers (cover panel) for unoccupied spaces (later expansion) as desired.

**UP TO 2 WALLBOXES**



Division between Carriers (carrier plate) for your wallbox model and covers (cover panel) for unoccupied spaces (later expansion) as desired.

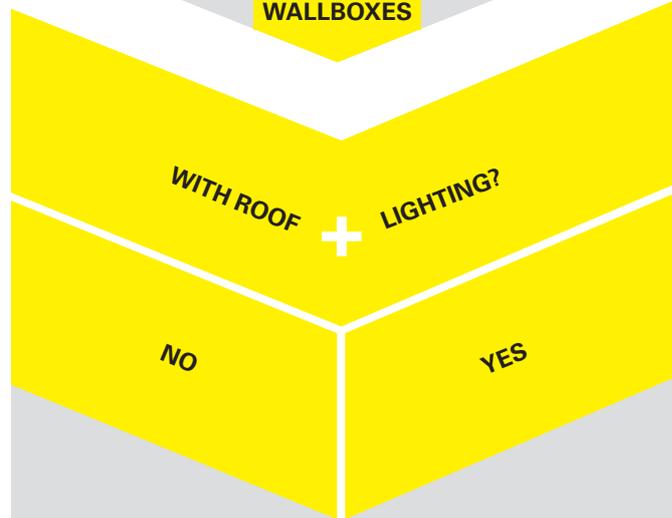
**UP TO 4 WALLBOXES**



**eFlex Advanced**



**eFlex Advanced Top**



**eFlex Comfort**



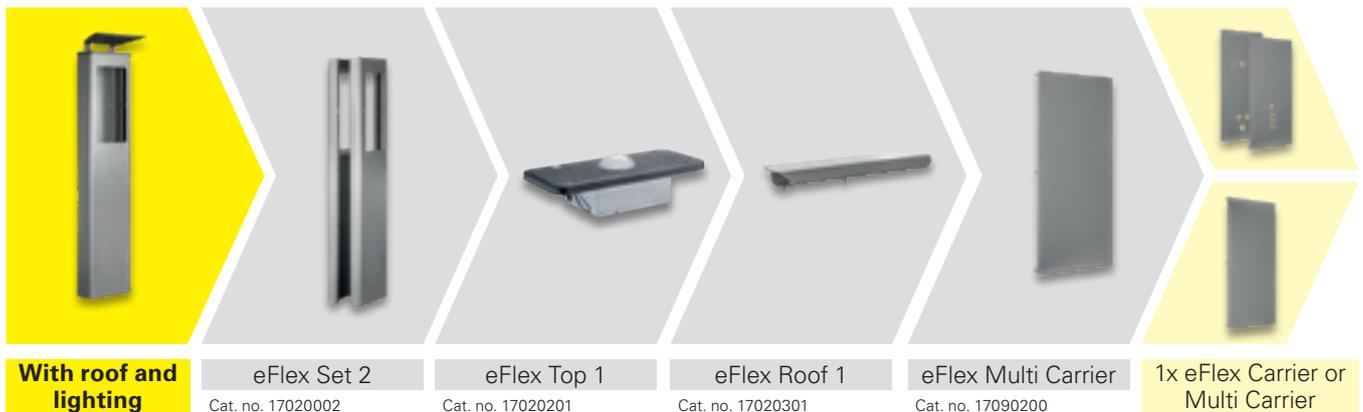
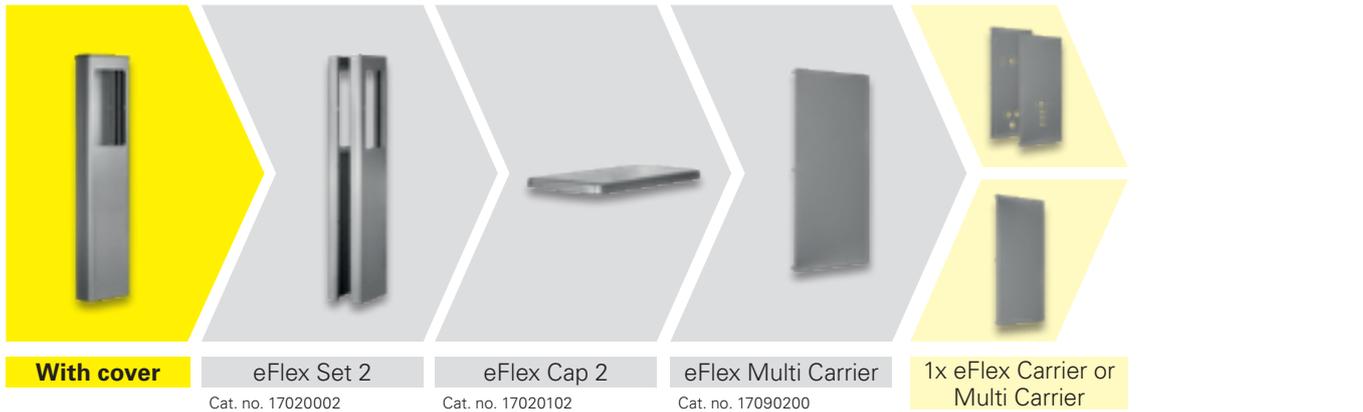
**eFlex Comfort Top**

# eFlex product overview

## eFlex Basic I

### Stand for one single wallbox

The rear of the stand body is sealed with eFlex Multi Carrier. It is made of stainless steel and can be drilled through for later installation of a second wallbox.

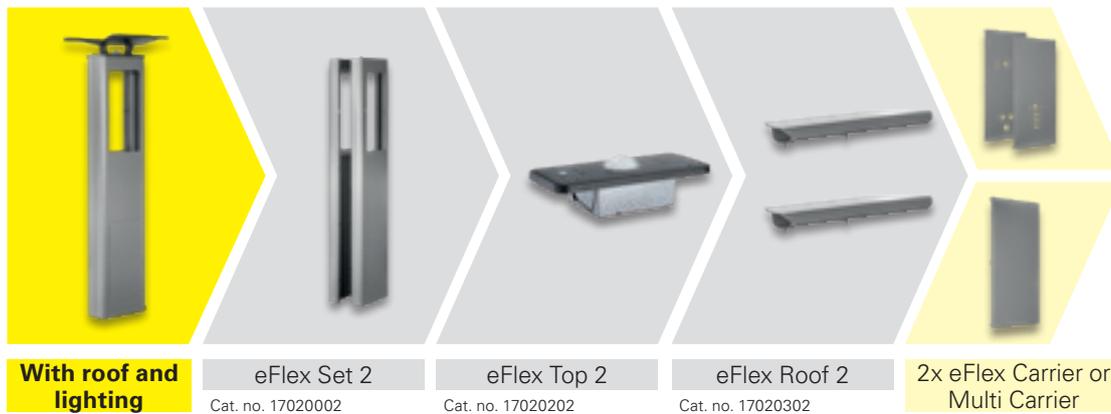


Type	Design	Pieces	Components	
-	With cover	1	17020002	eFlex Set 2
		1	17020102	eFlex Cap 2
		1	17090200	eFlex Multi Carrier
		1		eFlex Carrier or Multi Carrier
Top	With roof and lighting	1	17020002	eFlex Set 2
		1	17020201	eFlex Top 1
		1	17020301	eFlex Roof 1
		1	17090200	eFlex Multi Carrier
		1		eFlex Carrier or Multi Carrier

## eFlex Basic II

### Stand for two wallboxes at opposite parking spaces

When turned by 90°, you can also use this for adjacent parking spaces if the connections of the wallbox used remain accessible.

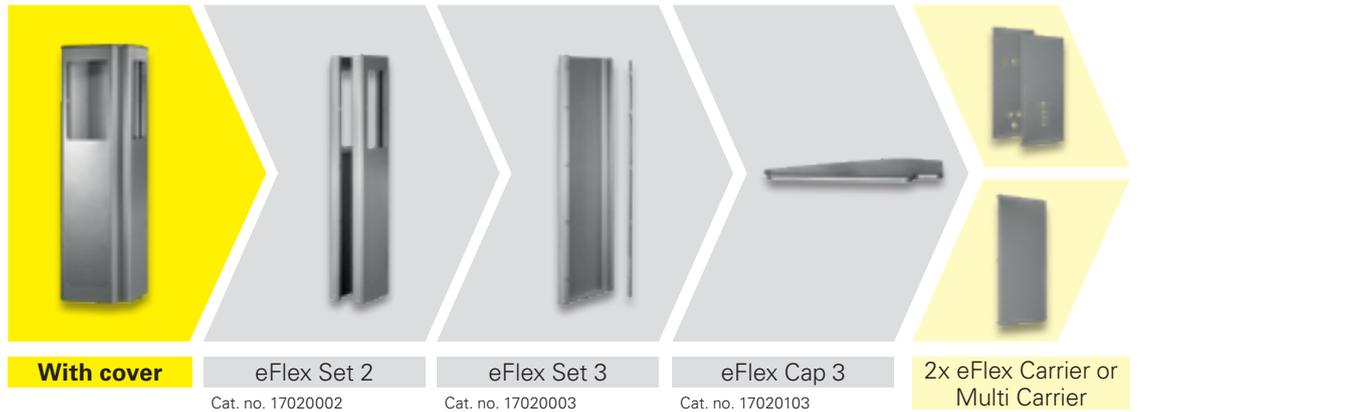


Type	Design	Pieces	Components
-	<b>With cover</b>	1	17020002 eFlex Set 2
		1	17020102 eFlex Cap 2
		2	eFlex Carrier or Multi Carrier
Top	<b>With roof and lighting</b>	1	17020002 eFlex Set 2
		1	17020202 eFlex Top 2
		1	17020302 eFlex Roof 2
		2	eFlex Carrier or Multi Carrier

## eFlex Advanced

### Stand for 2 wallboxes at adjacent parking spaces

Good accessibility of the wallboxes due to placement at a 45° angle to the parking space.

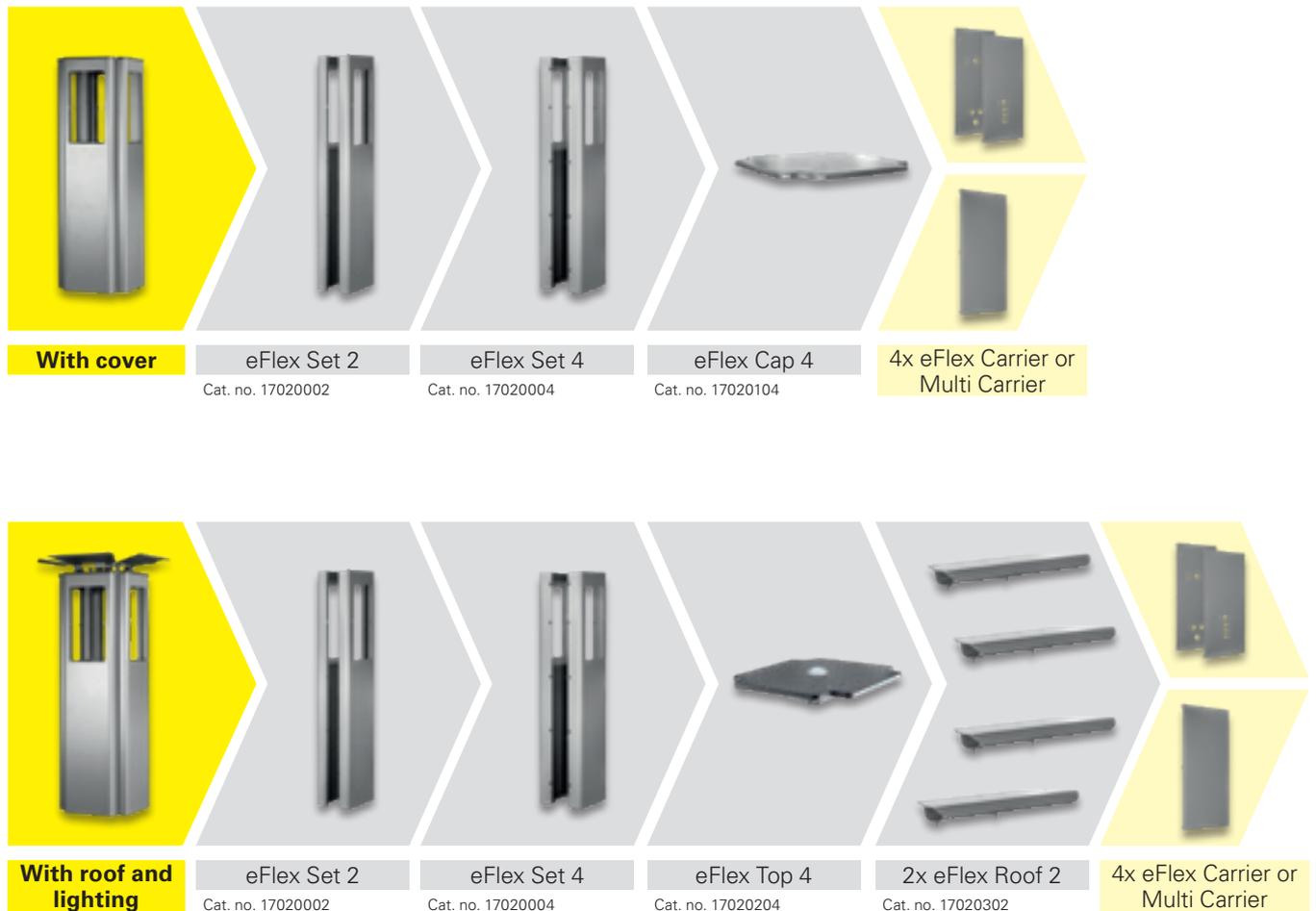


Type	Design	Pieces	Components
-	With cover	1	17020002 eFlex Set 2
		1	17020003 eFlex Set 3
		1	17020103 eFlex Cap 3
		2	eFlex Carrier or Multi Carrier
Top	With roof and lighting	1	17020002 eFlex Set 2
		1	17020003 eFlex Set 3
		1	17020203 eFlex Top 3
		1	17020302 eFlex Roof 2
		2	eFlex Carrier or Multi Carrier

## eFlex Comfort

### Stand for up to 4 wallboxes

Optimal at 45° angle amidst 4 parking spaces.



Type	Design	Pieces	Components
-	With cover	1	17020002 eFlex Set 2
		1	17020004 eFlex Set 4
		1	17020104 eFlex Cap 4
		4	eFlex Carrier or Multi Carrier
Top	With roof and lighting	1	17020002 eFlex Set 2
		1	17020004 eFlex Set 4
		1	17020204 eFlex Top 4
		2	17020302 eFlex Roof 2
		4	eFlex Carrier or Multi Carrier



## eFlex Set

### Basic element and additional elements to build the respective stand design

Set 2 is required as a basic element for each stand, Set 3 and Set 4 for the extension into eFlex Advanced or eFlex Comfort.

Made of steel, dip-coated and powder-coated in grey DB 702.

Cat. no.	Type	Length [mm]	Width [mm]	Height [mm]	PU [pcs.]	PU weight [kg]
17020002	Set 2	140	330	1482	1	20.00
17020003	Set 3	430	430	1482	1	12.00
17020004	Set 4	470	470	1482	1	20.00



## eFlex Cap

### Cover without lighting and roof

Cap 2 for eFlex Basic, Cap 3 for eFlex Advanced and Cap 4 for eFlex Comfort.

Made of steel, dip-coated and powder-coated in dark grey DB 703.

Cat. no.	Type	Length [mm]	Width [mm]	Height [mm]	PU [pcs.]	PU weight [kg]
17020102	Cap 2	149	339	1.5	1	1.20
17020103	Cap 3	439	439	1.5	1	2.20
17020104	Cap 4	479	479	1.5	1	3.50



## eFlex Top

### Cover with lighting incl. twilight sensor and roof fastening

Top 1 (roof on one side) and Top 2 for eFlex Basic Top, Top 3 for eFlex Advanced Top and Top 4 for eFlex Comfort Top.

Made of steel, dip-coated and powder-coated in dark grey DB 703.

Cat. no.	Type	Length [mm]	Width [mm]	Height [mm]	PU [pcs.]	PU weight [kg]	required roofs [pcs.]
17020201	eFlex Top 1	149	339	23.5	1	3.00	1
17020202	eFlex Top 2	149	339	23.5	1	3.00	2
17020203	eFlex Top 3	439	439	23.5	1	4.50	3
17020204	eFlex Top 4	479	479	23.5	1	4.50	4



## eFlex Roof

### Roof for mounting on eFlex Top

Roof 1 (single roof) for eFlex Top 1, Roof 2 (double pack) for eFlex Top 2 and eFlex Top 3, 2x Roof 2 (double pack) for eFlex Top 4.

Made of aluminium, dip-coated and powder-coated in dark grey DB 703.

Cat. no.	Type	Length [mm]	Width [mm]	Height [mm]	PU [pcs.]	PU weight [kg]	required roofs [pcs.]
17020301	Roof 1	234	415	96.4	1	20.00	1
17020302	Roof 2	234	415	96.4	1	12.00	2



## eFlex Carrier

### Pre-drilled steel adapter plates for many wallbox models

Made of dip-coated and powder-coated steel in grey DB 702.



Please check compatibility with wallbox model in advance, see data sheet.

Cat. no.	Type	Length [mm]	Width [mm]	Height [mm]	PU [pcs.]	PU weight [kg]
17090101	KEBA	20	265	476	1	1.65
17090102	MENNEKES	20	265	476	1	1.65
17090103 <sup>a</sup>	WALTHER	120	265	621	1	1.65
17090104	ABL	20	265	476	1	1.65
17090105 <sup>a</sup>	HAGER A	20	265	476	1	1.65
17090106 <sup>a</sup>	HAGER B	20	228	531	1	1.65
17090107	SPELSBERG	20	265	476	1	1.65
17090108	HEIDELBERG	20	265	476	1	1.65
17090109	ABB	20	265	476	1	1.65
17090110	ALFEN	20	265	476	1	1.65
17090111 <sup>a</sup>	SPELSBERG eBike	50	388	490	1	1.65
<b>NEW</b> 17090112 <sup>a</sup>	COMPLEO	44	265	476	1	1.65
17090113 <sup>a</sup>	KATHREIN	44	265	476	1	1.65
17090114 <sup>a</sup>	PRACHT	44	265	476	1	1.65

<sup>a</sup> = available on request



### eFlex Multi Carrier

#### Stainless steel adapter plate

Can be used for discretionary hole pattern design up to max. 230x445 mm or as cover panel for unoccupied wallbox spaces.

Made of dip-coated and powder-coated stainless steel in grey DB 702.

Cat. no.	Type	Length [mm]	Width [mm]	Height [mm]	PU [pcs.]	PU weight [kg]
17090200	Universal adapter plate / cover panel	20	265	476	1	1.65

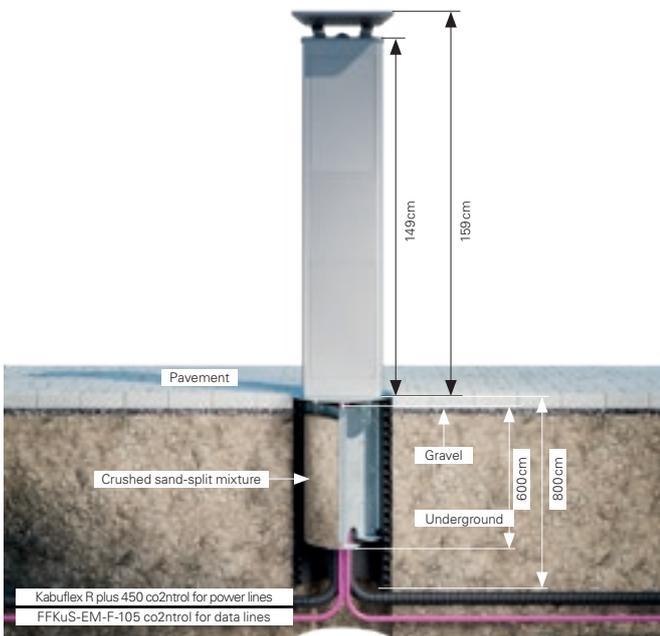


### eFlex Lock

- Inspection cover with lever
- Even easier maintenance of the eFlex stands thanks to twist lock
- Screwless installation
- Can optionally be used as a replacement for the inspection cover included in set 2
- Made of steel, dip-coated and powder-coated in DB 702
- To be ordered separately: Profile half cylinders (DIN 18252) with 40 mm length and 45° or 90° lock bit position

<b>NEW</b> Cat. no.	Type	Length [mm]	Width [mm]	Height [mm]	PU [pcs.]	PU weight [kg]
17029002 <sup>a</sup>	Lockable inspection cover	50	265	476	1	2.27

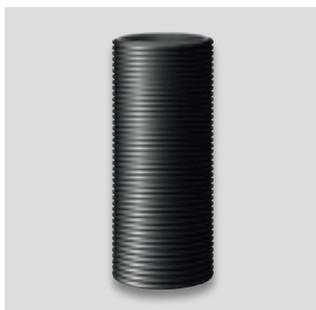
a = available on request



Furowell DN350 for eFlex Basic  
Furowell DN500 for eFlex Advanced / Comfort



## Foundations for stands



### Furowell

- Underground installation
- For all types of poles, masts and rods
- Preparation for charging poles and stands
- Structured-wall design for high stability
- Material: PE (DN 500 made of PP)
- Easy lateral drilling of connection openings using commercially available hole saws

Cat. no.	Technical specifications	Outside Ø [mm]	Inside Ø [mm]	Length [mm]	PU [pcs.]	PU weight [kg]	Pallet content [pcs.]	Colour
29510350	DN 350	400	345	0.8	1	5.20	12	black
29510500*	DN 500	571	497	1.0	1	13.00	2	

\* with yellow inside and incl. screwed transparent cover as protection against dirt during the construction phase



### eFlex FRE

- Pole foundation conduit insert for Furowell
- For fastening the eFlex stands using a pole foundation conduit adapter plate
- Installation with crushed sand-split mixture without surface sealing
- Material: galvanised steel
- Centrally positioned channel for the conduit feed
- The eFlex stands are levelled thanks to levelling up to 50 mm

NEW	Cat. no.	Type	Length [mm]	Width [mm]	Height [mm]	PU [pcs.]	PU weight [kg]	Colour
	17220350	DN 350	300	301	609	1	15.2	grey
	17220500	DN 500	471	414	609	1	20.3	



### eFlex FRA

- Pole foundation conduit adapter plate
- For fastening the eFlex stands to the pole foundation conduit insert
- Threaded bolts for quick and easy installation of the stand
- Material: hot-dip galvanised steel
- Centrally positioned recess for the conduit feed

NEW	Cat. no.	Type	Length [mm]	Width [mm]	Height [mm]	PU [pcs.]	PU weight [kg]	Colour
	17220102	Basic DN 350	430	430	5	1	5.3	silvery; hot-galvanised
	17220103	Advanced DN 500	600	600	5	1	9.9	
	17220104	Comfort DN 500	600	600	5	1	10.0	



## Plastic foundation

### Langmatz EK980 empty foundation for mounting the eFlex stands using adapter plates

Eight breaking points  $\varnothing$  110 mm per level ensure easy insertion of conduits.

Made of polycarbonate with hot-dip galvanised steel frame, incl. 2x stepped sleeves made of TPE, colour black.

Cat. no.	Type	Length [mm]	Width [mm]	Height [mm]	PU [pcs.]	PU weight [kg]
17120250	LW 250x550	400	695	615	1	40
17121400	LW 400x400	540	540	770	1	47



## Adapter plate

### Adapter plate incl. base plate for mounting the eFlex stands on the plastic foundation

Adapter plate made of hot-dip galvanised steel, base plate made of powder-coated stainless steel in dark grey DB 703.

Cat. no.	Type	Length [mm]	Width [mm]	Height [mm]	PU [pcs.]	PU weight [kg]
17120102	Basic LW 250x550	335	636	67	1	14
17121103	Advanced LW 400x400	494	494	63	1	15
17121104	Comfort LW 400x400	494	494	63	1	16.5



## Cast plate

### Cast plate to cover the plastic foundation

Can be used instead of adapter plates. Decoupling of civil engineering and construction of charging infrastructure possible. Made of cast iron B125 according to DIN EN 124 with locking device.

Cat. no.	Type	Length [mm]	Width [mm]	Height [mm]	PU [pcs.]	PU weight [kg]
17122250	LW 250x550	334	635	84	1	29
17122400	LW 400x400	478	478	65.5	1	30



## Earthing and strain relief set

The earthing and strain relief set provides a simple interface for earthing and potential equalization as well as strain relief for power cables.

Strain relief for 2 cables cross-section 34-42 mm, made of galvanised steel.

Cat. no.	Type	Length [mm]	Width [mm]	Height [mm]	PU [pcs.]	PU weight [kg]
17123250	LW 250x550	550	45	145	1	1.50
17123400	LW 400x400	400	45	150	1	1.25



## Kabuflex® KDS SD

### Cable grommet plugs for sand-tight sealing towards the foundation

Also suitable for the feed-through of cable conduits up to type 32, for example for the inserting of data lines.

Internal foam insert provides additional protection against silting up.

Also suitable for subsequent installation due to the hinged mechanism.

Cat. no.	Type	Length [mm]	Width [mm]	Height [mm]	PU [pcs.]	PU weight [kg]
19972125*	125	140.0	130.0	118.0	10	1.62

\* compatible with Langmatz plastic foundations

## Wiring infrastructure for various applications

### Wiring infrastructure underground

- With its ideal insertion characteristics, the FFKuS-EM-F105 co2ntrol eco-balanced electrical conduit makes an important contribution to more sustainability.
- The ecobalanced Kabuflex R plus 750 co2ntrol cable conduit with very high compressive strength is ideally suited for installation underground or in concrete.

### Sealing of conduit systems charging infrastructure

- For occupied Kabuflex conduits, Kabuflex KDS SD enables a sand-tight seal between conduit and cable. Due to the hinged mechanism, it can also be installed retrospectively. The foam insert inside also protects against silting up. FRÄNKISCHE recommends: Article 19972125 is compatible with the entries in the Langmatz plastic foundation. For data lines, cable conduits up to type 32 can be fed through here without any problems.
- The Kabu-BV blind plug can be used for the gas-tight and water pressure-tight sealing of unoccupied Kabuflex conduits.
- The comprehensive range of accessories includes, among other things, sand-tight couplings which, in combination with profile sealing rings, ensure a watertight connection between conduits.

### Sealing systems building lead-through

- Our Kabuflex system secures the gas-tight and water pressure-tight building lead-through of supply lines such as power and communication cables according to TAB 2019 with the required water pressure-tightness of up to 1.5 bar.
- The range of Kabu sealing products includes conduit and cable sealings for gas- and water-tight building lead-throughs through the foundation slab and via the basement wall.
- **NEW** Wall lead-through via the FA 150 VBF front flange



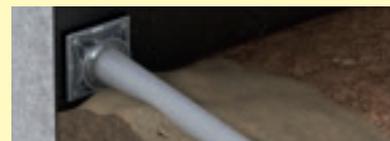
Video



Foundation slab lead-through for buildings without basements



Wall lead-through for buildings with basements



Wall lead-through system via front flange

### Multi-storey car park Underground car park

- Our steel conduit range incl. accessories is ideally suited for exposed installations to expand the charging infrastructure in multi-storey car parks and underground car parks.
- The steel conduit is used for environments requiring high mechanical strength and fixed connections, as well as for protection against vandalism.

### Photovoltaics

- We support the massive expansion of solar energy generation with suitable cable conduits such as Co-flex PP-UV, which protects the connections between the individual solar modules in photovoltaic systems, and Kabuflex types, which are ideally suited for underground and above-ground cable protection.
- Finally, FFKu-Smart net with low friction inner surface can distribute the electricity generated in photovoltaic systems throughout the building.



Video

# Everything from a single source

Wiring infrastructure  
underground

FFKuS-EM-F-105 co2ntrol



Kabuflex R plus  
750 co2ntrol



Furowell



Furowell end cap



Sealing of conduit  
systems charging  
infrastructure

Kabuflex SD end cap



Transparent Kabuflex coupling



Kabuflex KDS SD



Kabu-BV



Sealing systems  
building lead-through

Kabu-Seal



Wall collar set



Kabu-IN DD



Kabu-IN



Multi-storey  
car park  
Underground  
car park

Staro Gewinde-ES-V



SB-E-V



SSG-E-V



E-Ku-ET



Photovoltaics

Co-flex PP-UV



Kabuflex R plus  
450 co2ntrol



Kabuflex-R UV



FFKu-Smart net



# Technical basics of charging infrastructure for electromobility

## Charging methods

### Charging with alternating current (AC charging)

Cable-bound transmission of electrical energy (AC charging station or AC wallbox) from the power grid to the vehicle takes place with one or three phases.

The charger of the vehicle shall...

- effect rectification.
- control charging of the battery.

### Charging with direct current (DC charging)

Cable-bound (DC charging station or DC wallbox).

The charger shall...

- be integrated into the charging station.
- control the charging process via a communication interface between the vehicle and the charging station.

### Inductive/wireless charging

- Through transformer coils in the vehicle and the charge point (e.g., in the garage floor)
- Still subject to standardisation, not yet widespread

Charging technology	Charging capacity [kW]	Charging current [A]	Network connection of charging infrastructure
AC, 1-phase	Up to 3.7	Up to 16	AC, 1-phase, 230 V, 16 A
AC, 3-phase	Up to 22	Up to 32	AC, 3-phase, 400 V, 3 x 32 A
DC	Up to 100	Up to 200	AC, 3-phase, 400 V, 3 x 125 A

## Connected load

Proper dimensioning of the connected load is a decisive factor of secure and reliable charging operation.

Therefore, the following shall be considered during planning:

- type and number of vehicles to be expected for this site,
- charging capacity of the vehicles to be connected,
- average parking duration to be expected, and
- charging habits of the vehicle owners.

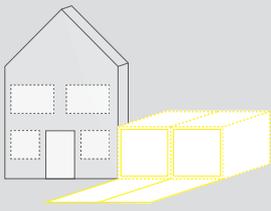
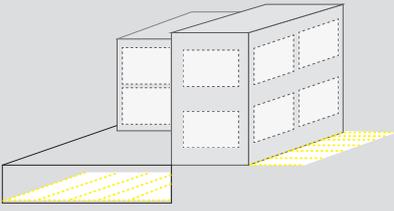
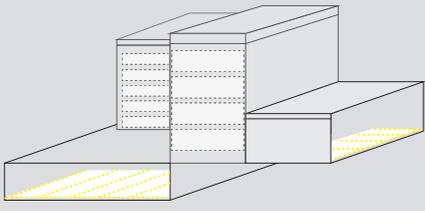
Besides, the demand for the connected load can be reduced by means of load management.

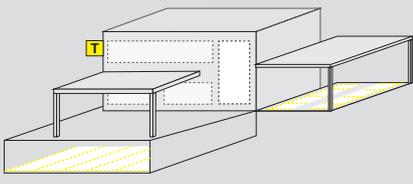
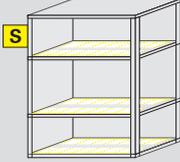
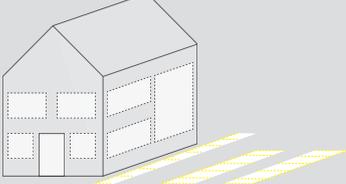
It has to be determined for each charging station how many charge points shall be available and whether or not these shall be operated simultaneously at full capacity; this will make planning elaborate and vague.

## Installation location

- When selecting the location, security shall be given top priority
- It must be possible to connect the vehicle without extension cables
- Place the charging station in the direct vicinity of the parking spaces to be supplied
- Use as a free-standing charging column or a wall-mounted "wallbox"
- Ensure the stability of the entire structure

A forward-looking selection of the location shall also consider subsequent extensions, individual user needs and the connection of PV systems and battery storage units.

Private installation location		
		
One-car/two-car garage or parking space at home	Parking spaces and/or underground garages of residential complexes	Company parking areas on own premises

Publicly accessible installation location		
		
Truck stop, motorway service station, customer parking areas	Shopping malls, car parks, event venues	Roadside, public parking spaces

## Load management

The available capacity can be smartly distributed among the vehicles to be charged by means of a load management system that reduces the maximal connected load required. Load management offers intelligent control of charging, e.g., by limiting the maximum output or prioritisation of charging processes.

### Suitability and benefits

- Prevention or reduction of costly load peaks
- Prevention of overload in electrical installations
- Reduced dimensioning of installations possible

**Different functions of charge points require networking between charging columns and/or with cloud services.**

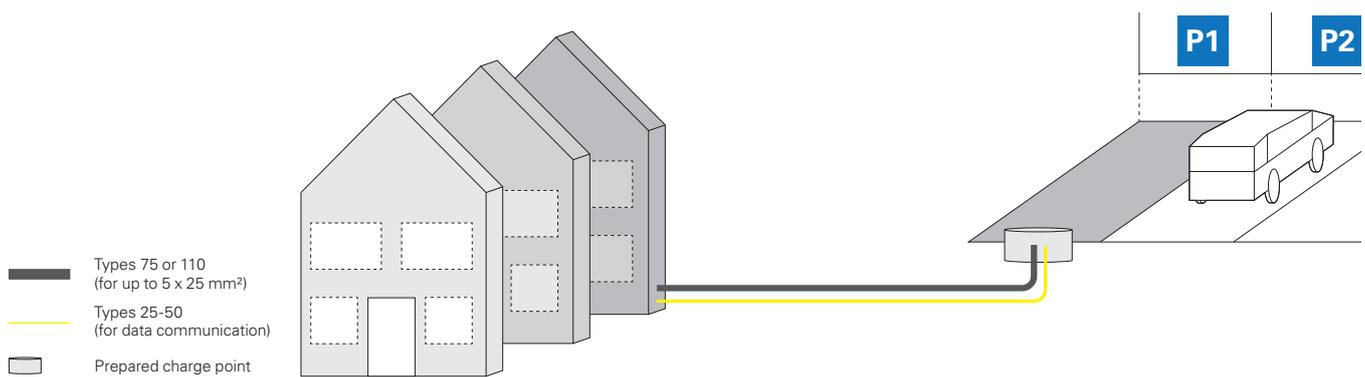
Authentication, transfer of the charge point status, transfer of the meter status and billing information or load management require access to the so-called backend, i.e., a downstream network structure, such as a database server, on which the information can be stored or from which it can be retrieved.

For large properties, it shall also be considered whether charging directly connected to each respective metering for billing shall be possible for each parking space. Alternatively, central charging stations can be provided that will be erected, operated and billed by the service provider.



## Planning principles

### Wiring infrastructure for single-family home/row house



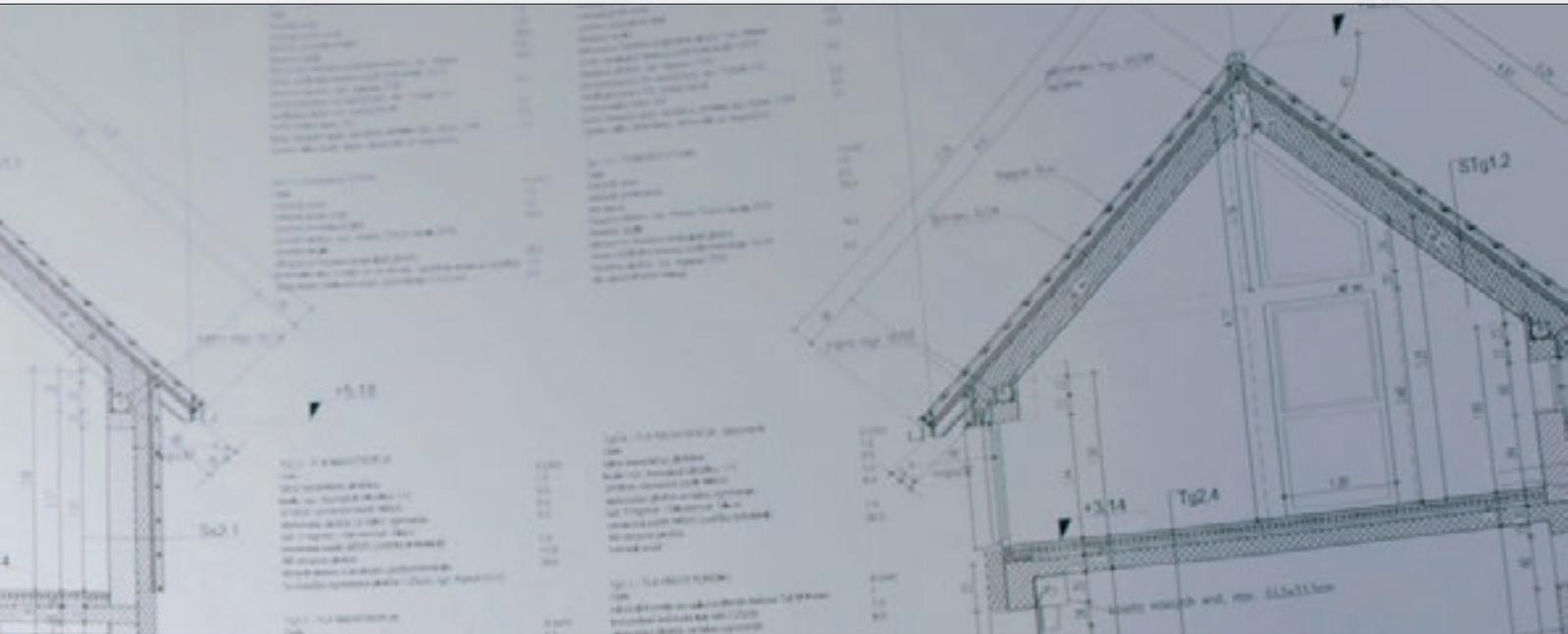
For single-family homes as well as semi-detached and row houses, the infrastructure is usually installed between the electricity meter of the respective party and the desired parking space where the charge point shall become available.

The basis for the future charge point is created by means of a suitable building lead-through and two underground conduits from the meter room to the parking space. The data line will later be used to connect the charge point to the network and the internet, for instance, to allow load management or communication with a PV system and storage.

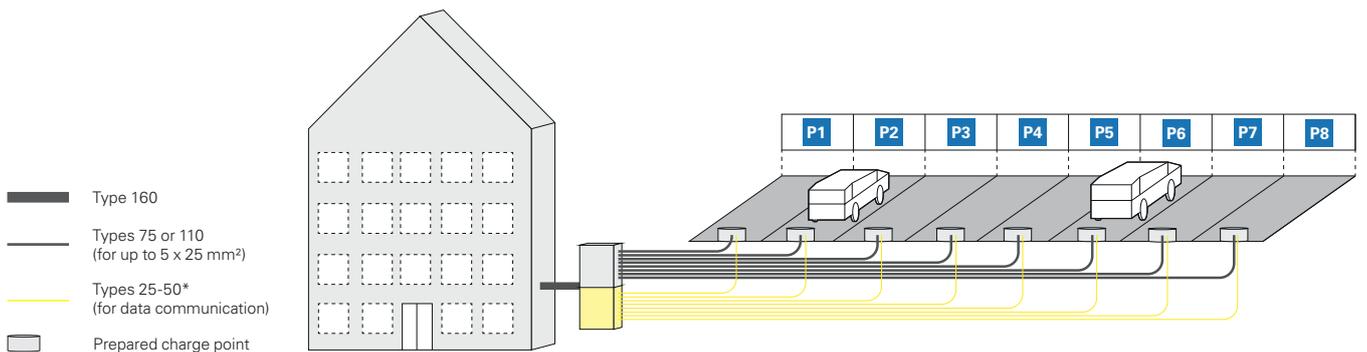
Data connection is also partially prescribed by energy suppliers in order to maintain network stability. There is currently no regulation for residential buildings with less than six parking spaces according to the GEIG; yet, it is recommended that a suitable infrastructure should be prepared here as well. This can be supported, for example, by means of funding options for charge points.

**The costs of retrofitting at a later point WITHOUT suitable conduits are approx. 6 to 8 times higher!**

(see "Smart Home and Smart Building, Part II", ZVEH, ZVEI, 24.05.2019)



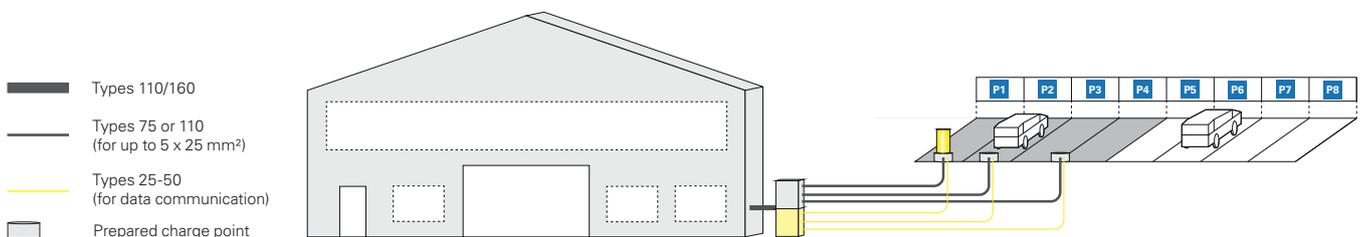
### Wiring infrastructure for multi-family home



In multi-family homes, the conduits for energy and data lines to individual parking spaces are collected at one central point. Depending on the conditions and preferences, this collection can take place via a separate control cabinet, or the wires can be bundled and routed into the building to be connected there.

\* ATTENTION: Series connection is partly required to interconnect the charge points. If the prepared charge point and the distributor are far away from each other, one conduit each shall be included between two charge points respectively!

### Wiring infrastructure for commercial premises



The structure of commercially used buildings is similar to that of residential buildings. Since there is a central owner, several parking spaces with one wiring infrastructure can also be provided depending on the existing requirements, position and number of charge points per charging column, e.g., to erect charging columns with two charge points between two parking spaces.

**The costs of retrofitting at a later point WITHOUT suitable conduits are approx. 3 to 3.5 times higher!**

(see "Smart Home and Smart Building, Part II", ZVEH, ZVEI, 24.05.2019)

## Charging infrastructure partners for e-mobility

Five German brands involved in the universally applicable eFlex stands

FRÄNKISCHE, DEHN, Doepke, Langmatz and Spelsberg: Five German brands in the electrical industry are teaming up to advance the expansion of electromobility. Each company is contributing its part to the new, modular eFlex system, which creates flexible charging solutions for electric vehicles.

Each of the five partners is an established specialist in their field and contributes technically mature solutions for building the integrated charging and wiring infrastructure – for future-proof investments and planning reliability.



### Langmatz GmbH

Karl-Heinz Hebermehl  
Technical  
sales operations



+49 8821 920-126

k.hebermehl@langmatz.de

## Langmatz

Langmatz – innovative capacity meets performance

Langmatz is an internationally operating industrial company for plastics and metal processing with headquarters in German Garmisch-Partenkirchen. As a specialist for technical system solutions, we are one of Europe's leading infrastructure providers for energy technology, telecommunication and traffic engineering. Our core competencies lie in research and development, design, and the production and marketing of high-quality infrastructure products. We have a high vertical range of manufacture and spend a great deal of time and effort on development in order to further develop the product portfolio in line with customer requirements. The Langmatz brand stands for innovative products with international standards and highest quality "Made in Germany". Our customers and their needs are our top priority – a claim that is reflected in countless customized system solutions in the company's over 55-year history. Among Langmatz's customers are energy suppliers, local utilities, municipalities, public utilities and telecommunications companies.



## Günther Spelsberg GmbH + Co. KG

### Günther Spelsberg GmbH + Co. KG

Christoph Kramer  
Technical sales



+49 2355 892-271  
+49 2355 892-155

ckm@spelsberg.de

When you trust in Spelsberg, you will be rewarded with expertise in enclosure technology and experience since 1904. Our high innovative capacity has resulted in many patents and provides solutions that are quick and easy to install, and that impress thanks to their long service life and ease of maintenance. Currently, the product range includes well over 5,000 widely available items, including junction boxes, small-scale distributors, terminal block enclosures, meter enclosures and industrial enclosures. In addition, Spelsberg is considered an innovative supplier of high-quality products and well-matched systems for special industries and markets, e.g., for intelligent energy distribution, renewable energy generation as well as fire-protected installation technology with circuit integrity. Whether tool design, tool making or certified test laboratory – we still develop, implement and test everything in-house. Following a survey of craft businesses, 90 % of all processors know and use Spelsberg products, and are very happy with them. Today, customers also appreciate Spelsberg not only as a supplier but also as a developer of complete systems ready for connection and an expert consultant for demanding questions involving enclosures.

#### AK 12 small-scale distributor



1-row small-scale distributor, 12 available modules, with PE/N terminal (each 2x16 mm<sup>2</sup>, 10x6 mm<sup>2</sup>), metric knockouts top and bottom 1xM32/40, 2xM20/25, 8xM20, including accessories

- Protection class IP 65, impact strength IK 07
- 12 available modules
- with PE and N rail
- Accurately fitting installation for all eFlex stands

#### AK 24 small-scale distributor



2-row small-scale distributor, 24 available modules, with PE/N terminal (each 2x16 mm<sup>2</sup>, 14x6 mm<sup>2</sup>), metric knockouts top and bottom 1xM32/40, 2xM20/25, 8xM20, including accessories

- Protection class IP 65, impact strength IK 07
- 24 available modules (2x12)
- with PE and N rail
- Accurately fitting installation for all eFlex stands

#### AK-F 42 application examples



Example of an AK-F 42 design for installation in the eFlex Comfort stand with equipment from Doepke and DEHN for supplying up to 4 wallboxes.

- Distributor: Spelsberg AK-F 42
- Flanges: Spelsberg AK3 FL01
- RCD: Doepke, DFS 4 063-4/0,03-A EV HD
- Circuit breaker: Doepke, DLS 6i B16-3
- Overvoltage protection: DEHN, DEHNvap EMOB

#### AK-F 42 small-scale distributor



3-row small-scale distributor, 42 available modules, with PE/N terminal (each 6x16 mm<sup>2</sup>, 21x4 mm<sup>2</sup>), ventilation element included, flanges required additionally

- Protection class IP 65, impact strength IK 08
- 42 available modules (3x14)
- with PE and N rail
- Precisely fitting installation in the eFlex Comfort stand

#### AK-F 56 small-scale distributor



4-row small-scale distributor, 56 available modules, with PE/N terminal (each 6x16 mm<sup>2</sup>, 21x4 mm<sup>2</sup>), ventilation element included, flanges required additionally

- Protection class IP 65, impact strength IK 08
- 56 available modules (4x14)
- with PE and N rail
- Precisely fitting installation in the Flex Comfort stand

#### Accessories: AK3 flanges



In order to seal the AK-F 42 and AK-F 56 distributors, you need two AK3 FL flanges.

- AK3 FL 00: without knockouts
- AK3 FL 01: with knockouts 1xM50/40, 2xM40/32, 2xM20
- AK3 FL 02: with knockouts 5xM25/20, 4xM20, 2xM16



## DEHN

### DEHN SEG

Jürgen Holler  
Key Account Manager EMOB



0151 44019685

juergen.holler@dehn.de

DEHN SE lightning and overvoltage protection for the charging infrastructure of electromobility. A thunderstorm always comes as a surprise. The lightning currents and overvoltage that occur are a considerable risk and cause serious damage to the charging infrastructure and the electric vehicle. Secure your investments and protect yourself from costly damage to the charge controller, the battery and the electronics of the charging system – with high-quality, tested DEHN protection solutions. Owners of electric vehicles are thus offered a reliable, safe way of charging their vehicles. Charging station operators gain an image boost through higher availability and vehicle protection. With DEHN lightning and overvoltage protection, you meet all of the current normative requirements, e.g., DIN VDE 0100-722, DIN VDE 0100-443, DIN VDE 0100-534, VDE 0185-305 lightning protection standard and VDE AR-N 4100.

#### DEHNvap EMOB



AC power supply protection

- SPD type 1+2+3 combined arrester
- Based on RAC spark gaps technology
- 250 A max. preliminary fuse
- Universally applicable (3+1 relay)
- Quick, uncomplicated e-check

#### DEHNcord 3P



AC power supply protection

- Types 2+ 3 overvoltage arrester
- Stub or feed-through wiring
- Push-in terminal up to 6 mm<sup>2</sup> CU
- Universally applicable (TT and TN system)
- Quick, uncomplicated e-check

#### BLITZDUCTORconnect ML 2 BD 24



Protection of data and communications lines

- Types 1 + 2 combined arrester
- Protection of one twin wire of floating balanced interfaces
- Modular, pluggable
- Signal isolation
- Push-in terminal

#### DEHNpatch Class E



Protection of data and communications lines

- Type 2 / P1 overvoltage arrester
- For all data services up to 57 V DC
- Protection of 4 wire pairs via RJ 45 sockets
- 250 MHz bandwidth
- Fully screened

#### K12 equipotential bonding terminal



Main potential/lightning protection equipotential bonding

- Normative reference DIN EN 62561-2
- Connection (single-stranded/ multi-stranded): 10 x 2.5-95 mm<sup>2</sup>
- Round connection: or 10x10 mm, flat: 1 x -30x4 mm
- Section: 30 mm<sup>2</sup>
- Mounting: [2x] 6x8 mm

#### V4A earth rod with connection terminal



Erection of the local earthing system

- Material: NIRO (V4A)
- Rod length: 1500 mm + diameter Ø: 20 mm
- Cross and parallel connection
- Round clamping range: 8-10 mm
- Connection (single-stranded/ multi-stranded): 4-50 mm<sup>2</sup>

# Doepke

Strom sicher nutzen.

## Doepke Schaltgeräte GmbH

Stefan Davids  
Head of technical sales



+49 176 12255886

stefan.davids@doepke.de

## Doepke Schaltgeräte

Electromobility is gaining momentum: Both the commercial and private sector are buying more and more electric vehicles. This is opening up a lucrative future market for electrical engineering companies: The more electric vehicles are on the road, the more charging points become necessary. Special regulations must be observed for their installation because charging columns, wallboxes and the like place special demands on residual current protection.

In addition, anyone, i.e., even non-professionals in the field of electrical engineering, needs to be able to operate charging facilities for electric vehicles. Therefore, they must meet highest safety standards. Doepke Schaltgeräte GmbH – an expert in the field of residual current protection – offers a comprehensive product range for the standard-compliant protection of charging facilities for electromobility. Doepke has developed the EV (electric vehicle) version of its DFS fault-current circuit breakers specifically for charging electric vehicles. It offers a complete protection concept packed in just one device. In addition, Doepke offers different product variants, service and information for all requirements in the field of residual current protection in e-mobility.

### DFS 4 EV



Critical smooth DC residual currents can occur when charging electric vehicles. Doepke has developed the EV (electric vehicle) version of its DFS fault-current circuit breakers specifically for charging electric vehicles.

- Tripping at max. 6 mA DC
- Type A certified according to IEC 62955
- Maintains the protective function of existing residual current protection devices

### DFS 4 A EV NA



Emergency STOP! –  
The new DFS 4 A EV NA

- Optimized for wallbox and charging column
- 6 mA DC current detection and EMERGENCY STOP function in one device
- EMERGENCY STOP circuit protected against wire breakage
- Integrated auxiliary switch for remote signalling
- Standard-compliant all-round protection also pursuant to IEC 62955

### Circuit breaker



The DLS 6 line offers a great selection of different types for use in residential and single-purpose buildings and in industrial applications.

- Low heat loss
- Space-saving designs
- Available in different characteristics and current ratings

### HD – heavy duty



Heavy duty –  
for harsh environmental conditions

- Insensitive to temperatures, harmful gases, dust and humidity
- Permanently protected – even in de-energized state

### Online seminar: Safe charging



Doepke-Akademie is a series of free online seminars on products and current topics. In these online seminars, Stefan Davids and Folkert Daniels provide information on residual current protection for charging facilities. Here you can watch the recording of the online seminar.

### E-mobility



Safe charging Here you will find a collection of information on products, normative requirements and current developments in the field of electromobility: brochures, technical articles, product videos, online seminars and, of course, all products for residual current protection for charging facilities.

# Contact

## Technical consulting

Hotline for user questions +49 9525 88-8123  
 tfb.elektro@fraenkische.de

**Fax** +49 9525 88-2151  
**PC fax** +49 9525 88-92-...

## Visit our websites

www.fraenkische.com  
 www.umweltrohr.de  
 www.leerrohrberater.de

## In-house technical consulting



### Bodo Schmidt

Phone +49 9525 88-2472  
 bodo.schmidt@fraenkische.de



### Sabrina Haupt

Phone +49 9525 88-2352  
 sabrina.haupt@fraenkische.de

## Field service technical consulting



### Thomas Schneider

Southeastern Germany

Phone +49 9525 88-2779  
 Mobile +49 171 379 71 68  
 thomas.schneider@fraenkische.de



### Saša Popović

Southwestern Germany

Mobile +49 151 742 13 624  
 sasa.popovic@fraenkische.de



### André Lüdecke

Western Germany

Mobile +49 171 297 46 31  
 andre.luedecke@fraenkische.de



### Stephan Bode

Northeastern Germany

Mobile +49 160 885 44 20  
 stephan.bode@fraenkische.de









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## FRÄNKISCHE

FRÄNKISCHE Rohrwerke Gebr. Kirchner GmbH & Co. KG | Hellinger Str. 1 | 97486 Königsberg/Germany  
Phone +49 9525 88-0 | Fax +49 9525 88-2413 | [marketing@fraenkische.de](mailto:marketing@fraenkische.de) | [www.fraenkische.com](http://www.fraenkische.com)

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