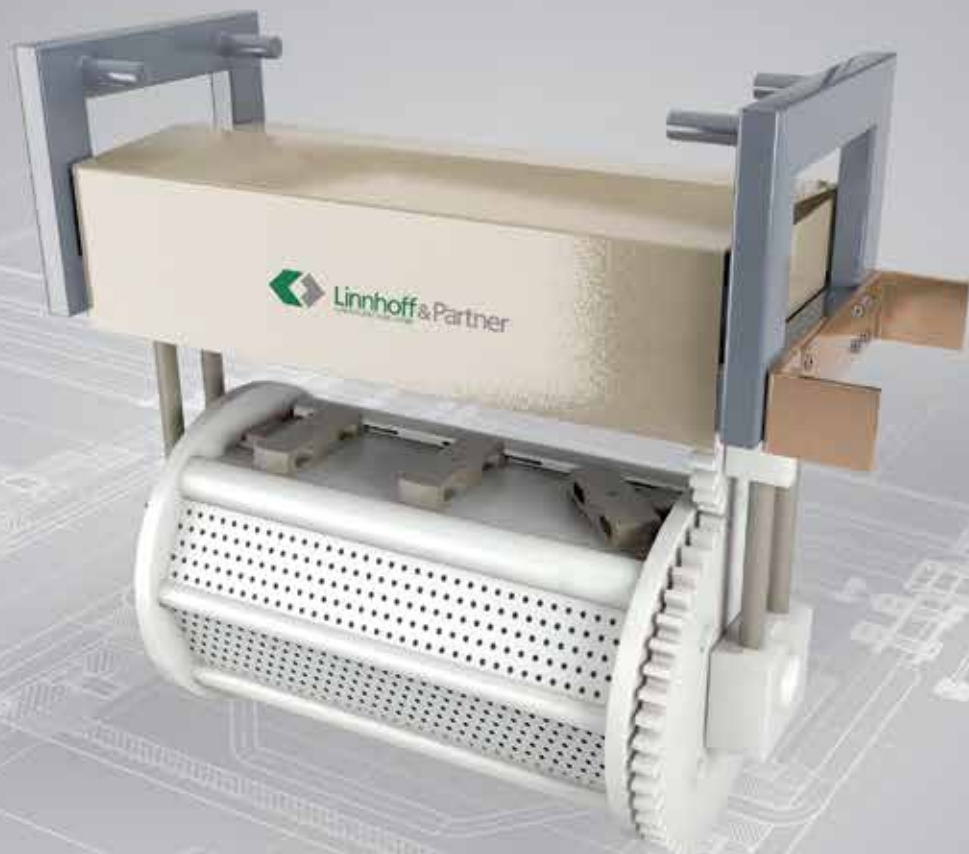




**Linnhoff & Partner**  
GALVANOTECHNIK GMBH

Customized solutions for the electroplating industry

# COMPLETE CATALOGUE



**Plating Barrels**



**Barrel aggregates**



**High Current Contacts**



# Plating Barrels & Aggregats

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## Customized solutions for the electroplating industry

We are a medium-sized company based in Iserlohn (North Rhine-Westphalia). Long-lasting experience has made us experts for electroplating and high-current technology. Our team has profound experience in planning, developing and achieving customized solutions.



We take customer-specific advice serious in order to identify the suitable products together with you.

Competence, commitment and ideas create the solid platform of our company. Our products share a high quality standard and stand out because of extreme durability.

As a competent partner we offer you intelligent and customized solutions for all aspects of electroplating.

## Barrel aggregates and plating barrels



**Ideas for electroplating and high current!**





# Barrel aggregates

We plan, construct and produce barrel aggregates appropriate to your system so that your machine can work without interruptions. Due to our perfect matching components we always provide the correct solution for your applications. Manufacturing as single or double-barrel aggregate or special construction.



## Drive

- SEW gear wheel motors
- protective varnish OS3
- special designs, speed regulation and swing control system possible
- brake optional

## Transport bars

- transport bars for chain hoists or carriers
- motor current contact system inside the carrier if requested

## Barrel carrier

- torsion-free constructions made of steel or stainless steel
- resistant to corrosion due to epoxy resin coating, pickled and passivated or rubberized
- individually designed carriers possible

## Protective cover

- protection for motor and gear units made of PP
- protection against process solutions and vapours

## Contact systems

- standard blade contact
- elastic motor current contacts
- cleaning devices for clean contact systems
- connecting rail for equipotential if requested
- other bars possible
- extensive range of standard types
- for detailed information see chapter 'High current technology'

## Bearing

- bearing as plastic sleeve bearing or liquid-tight metal sleeve bearing
- current transmission for electroplating by cable, disk, button, bar ... *(for further information see p. 14)*



# Barrel materials

Depending on the chemical and thermic stress parameters we use PP, PE 500 or ultra-high molecular polyethylene PE 1000 as barrel materials. It is also possible to produce barrels made of PPs and PVDF.

## Barrel material PP grey

- smooth, water-repellent surface
- resistant to chemical attack
- resistant to abrasion
- impact-resistant
- resisting temperatures of up to 80 °C
- weldable



## Barrel material PE 500 natural

- smooth, water-repellent surface
- resistant to chemical attack
- good resistance to abrasion
- particularly impact-resistant
- resisting temperatures of up to 90 °C
- weldable



## Barrel material PE 1000 natural

- smooth, water-repellent surface
- resistant to chemical attack
- extremely resistant to abrasion
- totally impact-resistant
- resisting temperatures of up to 100 °C



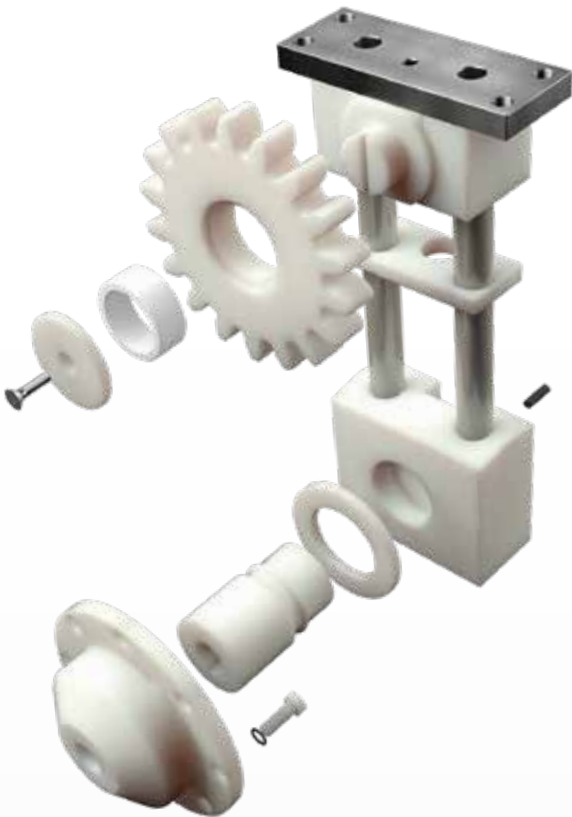
### Contrasting volumetric wear values of different materials

Material	density p in Kg/m³	wear
PE 1000	0,93	100
Steel St 37	7,85	160
PE 500	0,96	300
PP	0,92	600
PVC-hard	1,43	900
Bechwood	0,83	2.700

# Bearing systems

## Plastic sleeve bearing with cable contact

- interchangeable bearing pivots and bearing bushes
- flexible contact cables
- contact bulb made of steel, stainless steel, brass ...
- bushings with drain holes



## Liquid-tight metal sleeve bearing with disk contact

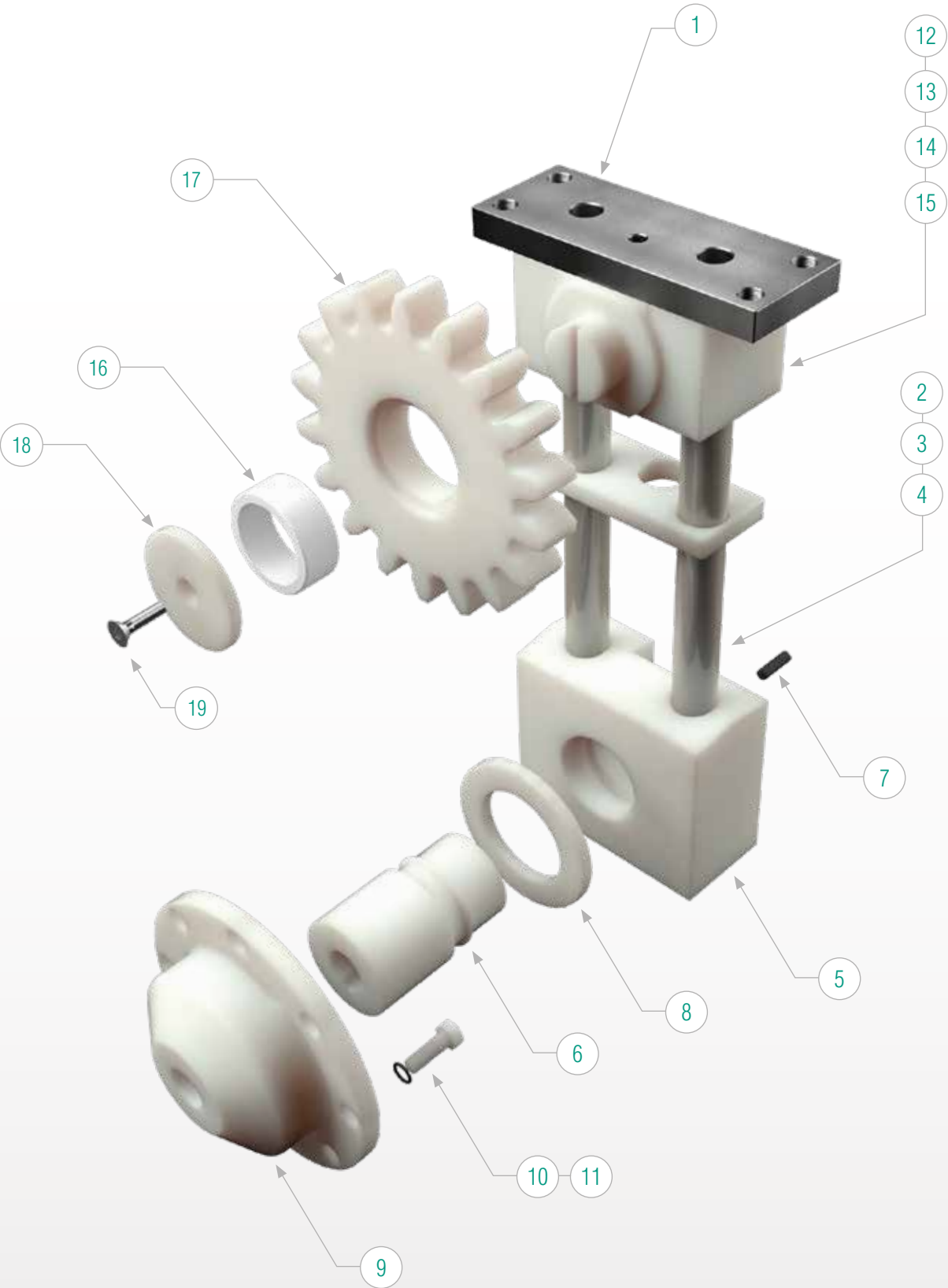
- solid steel arm
- contact disk firmly connected to the barrel
- rotating bellows
- special contact fluid inside the bellows
- wear-free static seals



# Plastic sleeve bearing

Single components for the plastic sleeve bearing with intermediate wheel bearing and cogwheel

Pos.	name	material
1	flange (80 x 20 x 150 for plastic sleeve bearing)	1.4301
2	stud bolt (length on demand)	C45
3	screw (m 12 x 25 – DIN 912)	1.4571
4	casing pipe (length on demand)	PP
5	carrier pivot bar	PE
6	carrier pivot	PE
7	grooved dowel pin (d = 10 x 30 – DIN 1473)	PVC
8	thrust ring	PE
9	bushing	PE
10	screw (m 16 x 40)	PE
11	O-ring (10,77 x 2,62 – ARP 111)	perbunan
12	idle wheel block (150 x 143,3 x 76)	PP glass fibre reinforced natural
13	screw (m 12 – DIN 933)	1.4571
14	washer (13,0 – DIN 7349)	1.4571
15	seal screw	PP
16	bearing bush	PTFE
17	cogwheel (model and number of teeth on demand)	PE 1000 natural
18	locking wheel	PE 1000 natural
19	screw (m 8 x 30 – DIN 7991)	1.4571

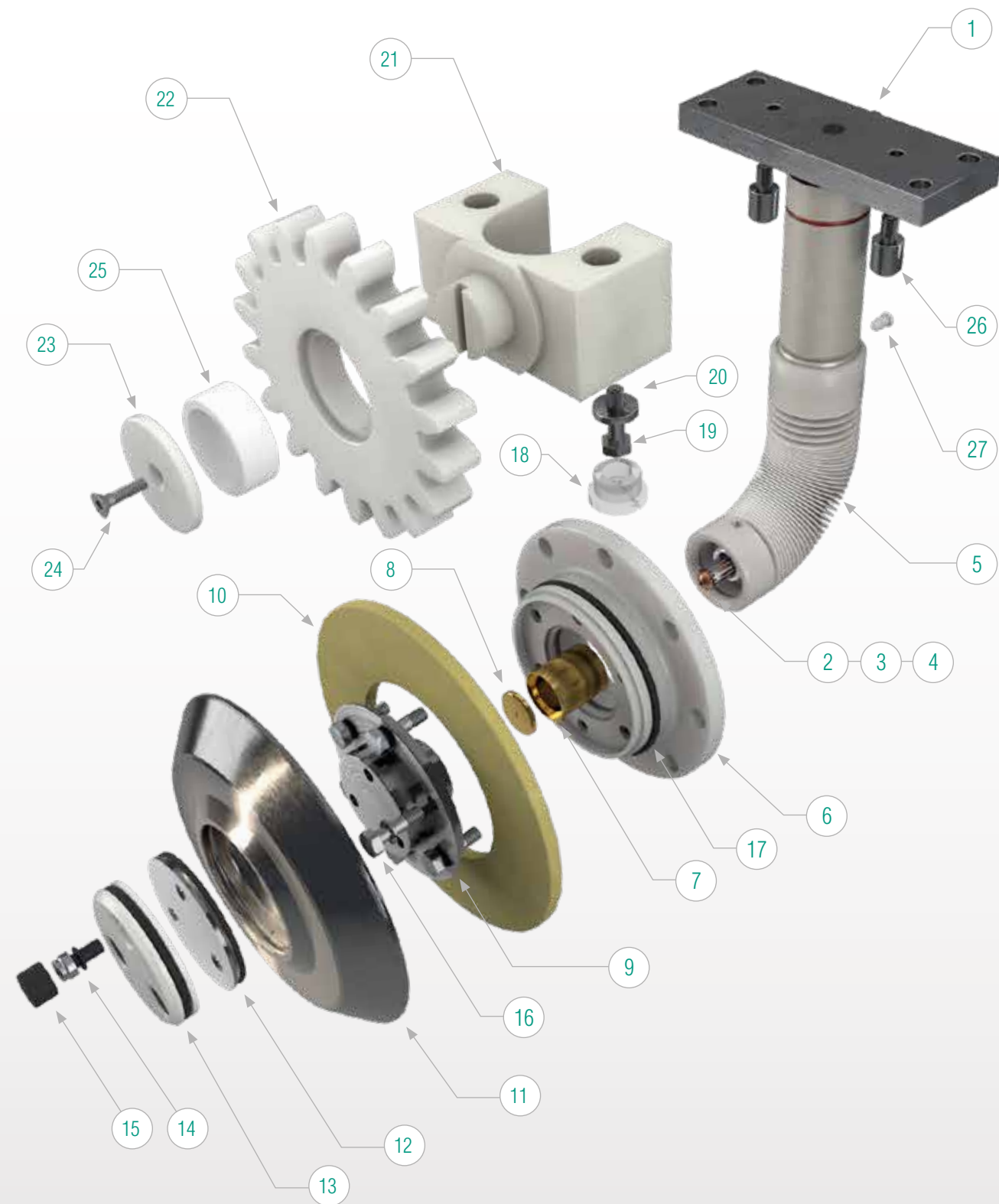






# Liquid-tight metal sleeve bearing with disk contact

Single components for the liquid-tight metal sleeve bearing with disk contact and intermediate wheel bearing and cogwheel

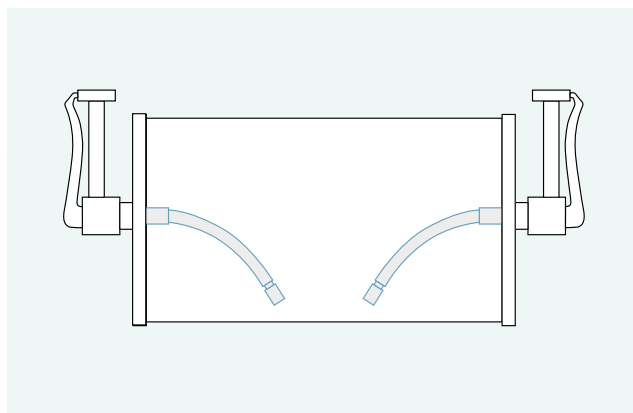


Pos.	name	material
1	support arm with flange	1.4301/st.
2	strip belt – LA1	Cu-Ag
3	compression spring	1.1200
4	contact pin	Cu
5	bellow with right-hand thread	PE 1000 natural
6	balancing flange	PE 1000 natural
7	bearing bush	Bz-Si
8	contact disk	Bz
9	bearing flange	St
10	seal ring	para rubber
11	contact disk st37	nickel-plated
12	flange + O-ring	1.4571 + perbunan / viton
13	locking disk + O-ring	PE 1.000 natural + perbunan / viton
14	screw (m 10 x 20 spec.) + O-ring	1.4571 + perbunan / viton
15	covering cap	PP
16	screw (m 10 x 25 – DIN 933)	1.4571
17	O-ring (129,54 x 5,33)	perbunan
18	sealing screw	PP
19	screw (m 12 – DIN 933) + spring ring	1.4571/st.
20	washer (13 – DIN 7349)	1.4571
21	idle wheel bearing block (height on demand)	PP glass fibre reinforced
22	cog wheel (model and number of teeth on demand)	PE 1000 natural
23	locking wheel	PE 1000 natural
24	screw (m 8 x 30 – DIN 7991)	1.4571
25	bearing bush	PTFE
26	bolt	1.4301
27	safety pin	PE 1000 natural



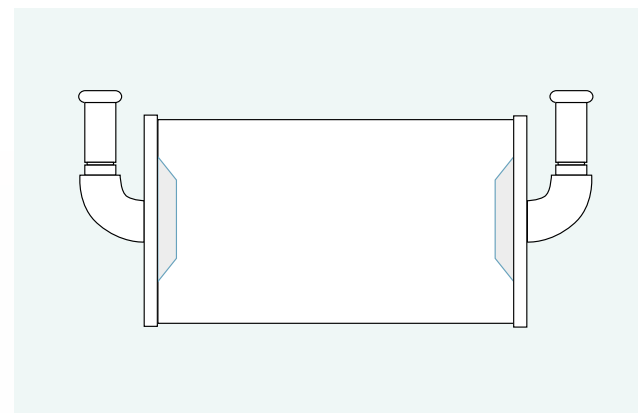
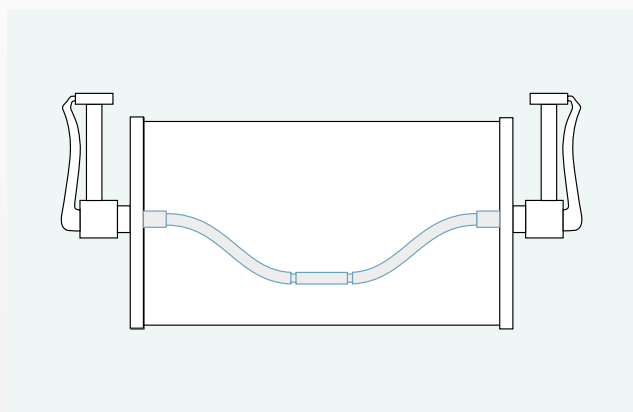
## Contact systems

We have developed various standard solutions to provide you with the optimal contact system for your range of products.



### Cable contact (dangler) with plastic sleeve bearing

Cable contacts are the most cost-efficient and widespread contact systems. They are particularly suitable for compact bulk goods. Thus they cover a broad range of application. They are also available with hollow bulb or in special designs.



### Disk contact with metal sleeve bearing

Disk contacts are excellently suitable for high current transmissions. They can be used for bulky, compact and sharp-edged goods as well as sensitive goods which could be damaged by static contacts.

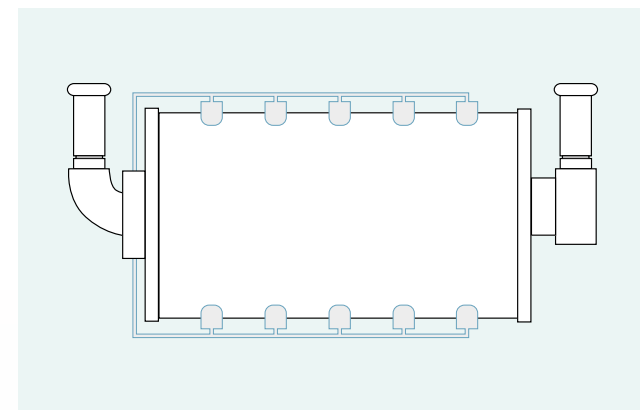
### Cable contact (dangler) with plastic sleeve bearing and continuous bulb

Cable contacts with continuous bulbs have a larger surface for a better contacting of the goods. Due to the loose-hanging contact bulb the goods are not hit. Therefore, this cable system is especially interesting for sensitive goods.

It can be easily installed and maintenance costs are low. It can also be obtained with a screwed contact bulb for a quick replacement and with a hollow bulb for extremely sensitive goods. A cost-effective alternative to a rod contact system.

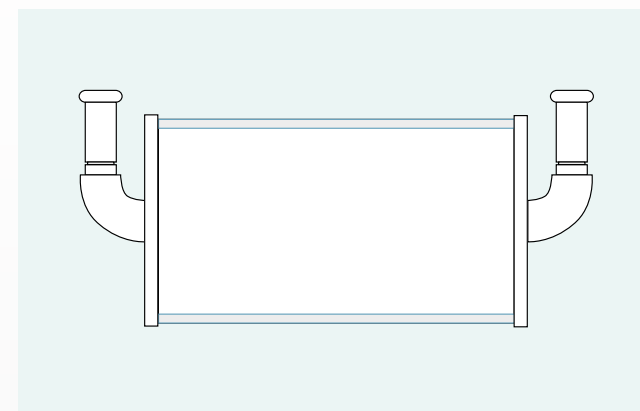
### Button contact with metal sleeve bearing

Similar to rod contacts, button contacts offer an even current transmission along the total inner length of the barrel. They are especially suitable for sensitive goods which could be damaged by static contacts. Moreover, even if the barrel is only filled minimally, they guarantee a perfect current transmission. Button contacts can be easily replaced.



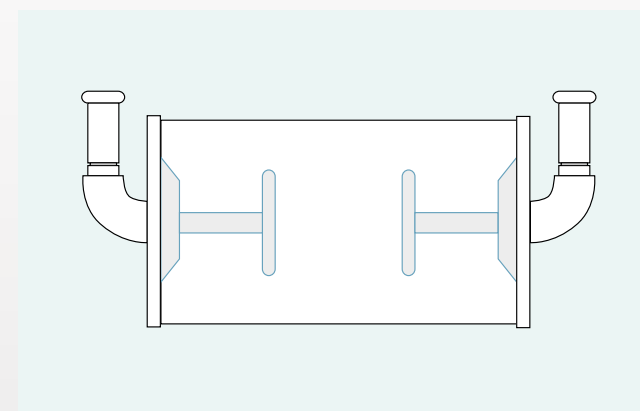
### Rod contact with metal sleeve bearing

Rod contacts are inserted into the edge bars of the barrel and transfer the current from the liquid-tight metal sleeve bearing via contact disks evenly along the total inner length of the barrel. The interior space of the barrel remains smooth. Rod contacts are suitable for electroplating a wide range of goods. This type of contact system is especially suitable for rod-shaped parts.



### Universal contact with metal sleeve bearing

Universal contacts offer the possibility to apply numerous different types of contacts and change them quickly if required. Customized special designs can be easily realised.







## Contact Cable

Our long-lasting contact cables are made of PUR sheathing as standard. This sheathing especially made for us is available in different diameters and cross sections. It is also possible to produce them of PVC, silicone and neoprene.

Our contact heads are available made of steel, brass, stainless steel or special materials like titan or copper. They can be designed in various versions: hollow, screwable, continuous or further designs. Ask for personal advice to enhance the durability of this item subject to wear.

### Cable lug / connection

- tubular cable lug in narrow design to enable an easy cable insertion through the bushing or carrier trunnion
- all standard drillings

### Sealing

There are 2 kinds of sealings available:

- The cable is protected against spray and dust by a rubber grommet.
- The cable can be liquid-tightly sealed by a sealing sleeve made of stainless steel.

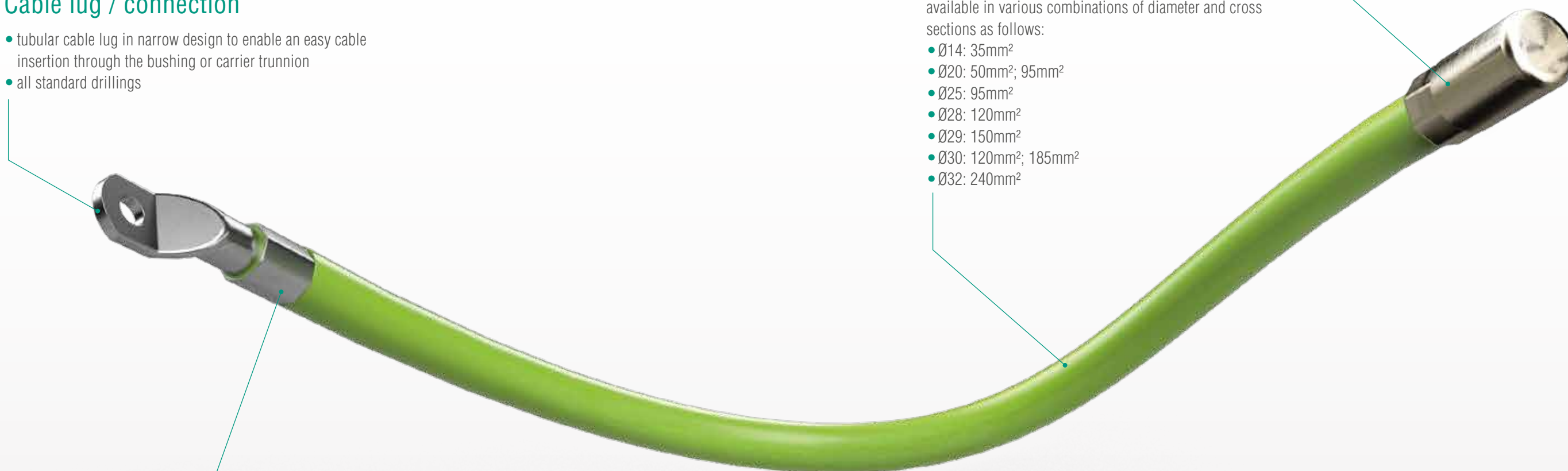
### Cable

The resistant PUR sheathing is extremely durable. It is available in various combinations of diameter and cross sections as follows:

- Ø14: 35mm<sup>2</sup>
- Ø20: 50mm<sup>2</sup>; 95mm<sup>2</sup>
- Ø25: 95mm<sup>2</sup>
- Ø28: 120mm<sup>2</sup>
- Ø29: 150mm<sup>2</sup>
- Ø30: 120mm<sup>2</sup>; 185mm<sup>2</sup>
- Ø32: 240mm<sup>2</sup>

### Contact head

- Contact heads are available made of steel, inox or brass as standard.
- Due to the eightfold pressing at a pressure of several tons a very tight connection to the sheathing is obtained.
- To enable a quick changing the contact bulb can also be produced in a screwable version.



You will find an application form for cable contacts on the internet at: [www.linnhoff-partner.com/en-downloads](http://www.linnhoff-partner.com/en-downloads)



## Cover systems

All cover systems can be opened and closed manually or automatically.

### L-shaped cover groove

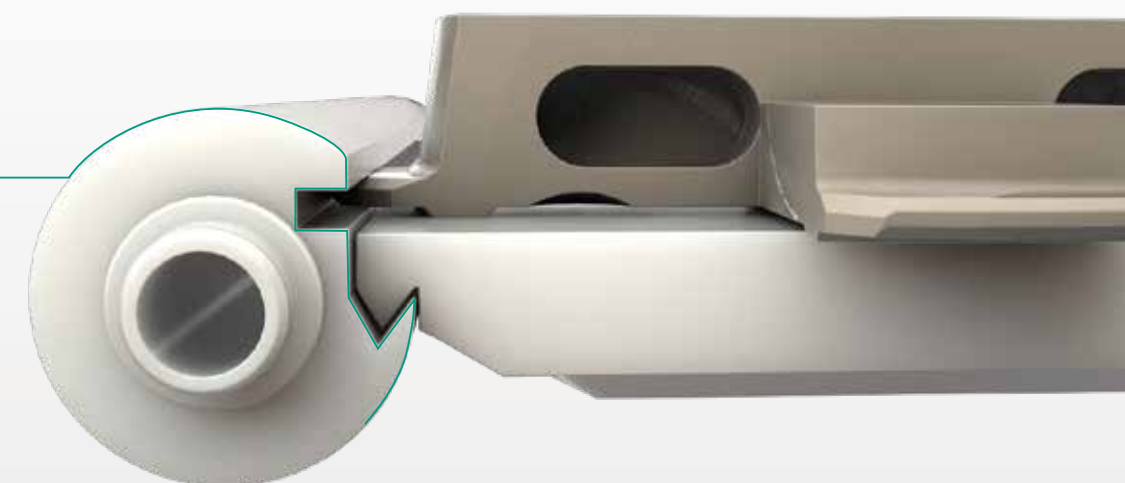
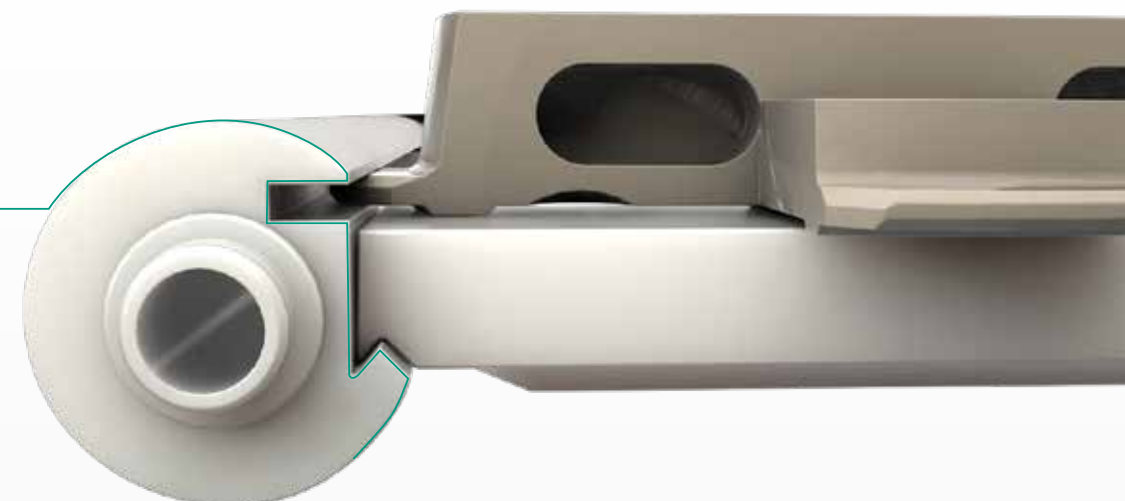
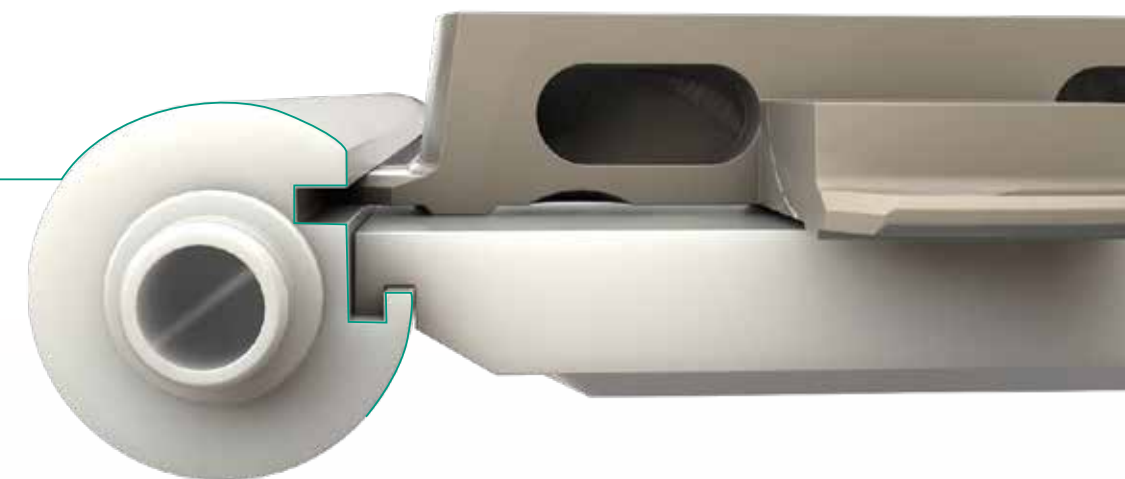
This proven and robust cover system version is ideal for most product ranges.

### VK-shaped cover groove

The preferred cover system which prevents even pointed parts from entering the groove. It is thus perfect not only for regular product ranges but also for very small, delicate and abrasive parts.

### V-shaped cover groove

Similar qualities to the VK-shaped model but only suitable for delicate, non-abrasive components.





# Perforations

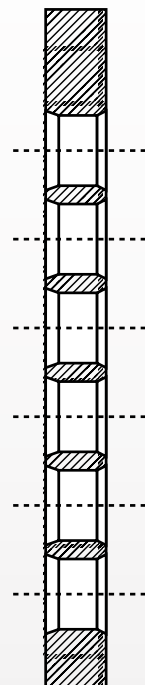
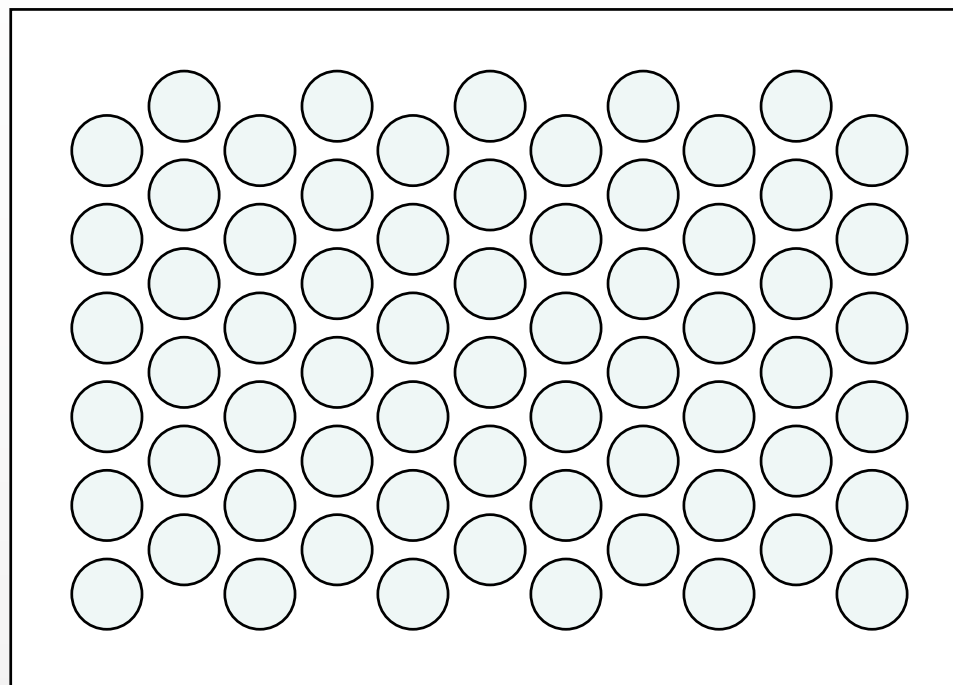
The quality and effectiveness of barrel electroplating is considerably depending on the kind and size of the perforation. We offer a wide range of different perforations in order to choose the perfect one for your applications.

## Round perforation

The outstanding quality of the barrel material allows an extremely close perforation. Inner and outer counterbores resp. milled recesses support the electrolytic exchange, reduce the drop in voltage in the wall, reduce carry-over losses and prevent flat components from adhering to the wet barrel.

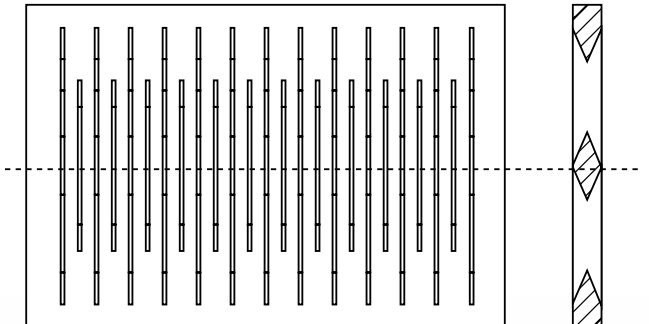
Special features:

- very close hole distance
- counterbores on both sides
- as for sticky components overlapping counterbores can be milled



## Slot perforation

Due to the overlapping milling of the slots the stability of the individual plates remains intact. The outstanding quality of the barrel material allows the very close perforation, therefore even higher component weights do not present a problem.



## Half-moon perforation

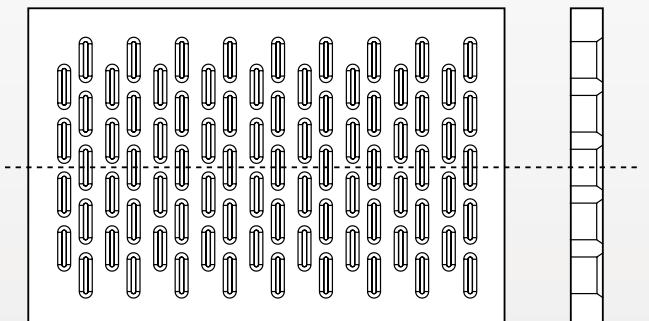
Among all kinds of perforation the half-moon perforation offers the widest range of products (nails, screws, coins, punched and bent components, and many more).

A considerably larger perforation space of up to more than 30 per cent (e.g. in contrast to an equivalent round perforation) guarantees a better electrolytic exchange. By means of special milling tools plates of up to 20 mm can be easily perforated in the half-moon version, thus resulting in considerably longer service lives. The conical form on the outside enables both a quick penetration and a quick draining of the electrolyte.



## Long-slot perforation

Similar to the design of the half-moon perforation, the long-slot perforation offers the same advantages. It has been developed to replace the sawn slot perforation as the dimensionally stable geometry avoids a widening of the perforation.







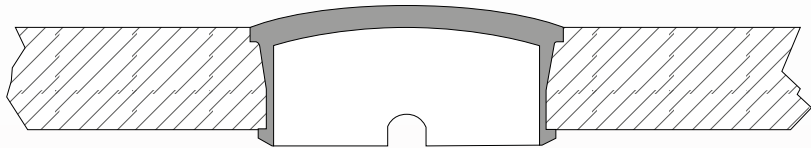
# Filter plugs

For a number of years now, our filter plugs have shown their worth – not only in the area of barrel technology. Meanwhile, our filter plugs are also used in filter systems and sieve plates. In the wide range of perforations and designs, the suitable filter plug for your application will also be found.

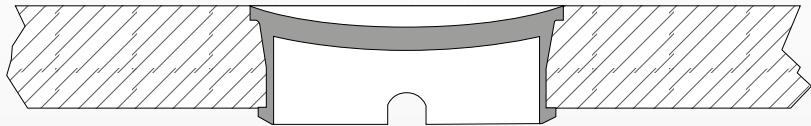
Our perforation system of filter plugs offers these decisive advantages:

- simple replacement of filter plugs\* for an optimal adaptation to the goods
- due to the arched form of the filter plug the adherence of flat components will be avoided
- the filter plug material reduces voltage drops and carry-over losses
- big chamfers facing outwards provide an excellent exchange of the electrolyte because of the additional pumping effect.

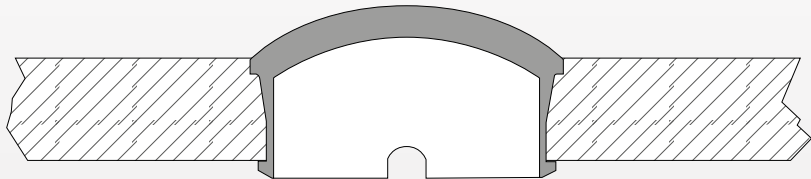
*\*The filter plugs cannot be reused afterwards.*



standard model



concave model



convex model

## A-filter plug product range Ø approx. 40 mm / material: PP

Pos.	name	artikel number
1	0,25 slot	90000100
2	0,4 slot	90064500
3	0,6 slot	90117800
4	1,3 slot	90018400
5	1,3 slot concave	90081800
6	1 x 1	90000400
7	1,75 x 1,75	90070300
8	2 x 2	90000500
9	2 x 2, convex	90000700
10	2 x 2, concave	90037900
11	3 x 3	90000810
12	3 x 3 convex	90000900
13	8 x 8 convex	90018300
14	0,25 slot with 2 x 2 raster	90000300
15	15 half-moon plug 1,3 mm	90823700

## E-filter plug product range Ø approx. 23 mm / material: PP

Pos.	name	artikel number
1	0,25 slot	90001300
2	0,4 slot	90019500
3	0,4 x 0,4	90117600
4	1 x 1	90017100
5	1 x 1 convex	90001400
6	2 x 2	90098900



## Small barrel aggregates

Developed for rational plating of small series or small parts, our small barrel series is frequently used for many different applications. Easy handling and the low weight of this series allow for batch weights of up to 13 kg. When a chain hoist is used, the weight per batch increases to up to 30 kg.

For the standard type, the barrel body is made of polypropylene; however, special designs in other materials are possible. For example, best results in chemical nickel applications have been achieved with PVDF barrels.



To reduce carry-over losses to a minimum, the entire barrel body is welded and the seams are smoothed. This prevents the product from getting caught in the barrel. A special groove structure at the fronts avoids that flat products stick to the surface. Owing to the largely dimensioned cover opening, easy product feed and removal is possible.

The attached cover provides optimal operational safety and easy handling. Position and shape of the cover are



designed in such a way that not even the smallest particles can get between cover and barrel body.

To transfer the plating current onto the product, different ways of contacting can be selected. One example is the classic cable contact, but also disk contacts, button contacts, pin contacts and many others are possible.

There is also the possibility of network-independent battery operation with a docking station and equipment with a

pendular unit, reverser unit or vibrating unit. To improve electrolytic exchange, an additional electrolyte injection pump can be added.

In short, the small barrel series is the optimal partner for rational plating. For electronic components, in the jewellery industry, for small series, subcontracted electroplating, research and development, the small barrel is a must.



## Satellite plating aggregates

Especially designed for bar-shaped flat or round material, these aggregates can be modified into single or double-barrel aggregates. The barrel can be divided into several usable segments by installing removable intermediate walls. These aggregates are designed for batch weights of up to 300 kg and lengths of up to 2500 mm.

### Protective cover

- protection for motor and gear units made of PP
- protection against process solvents and vapors

### Collector baskets with contact system

- The contact system is equipped with pin contacts which are set in midst the collector baskets. These contact pins can be designed one-sidedly, two-sidedly or continuously. Each one can individually exchanged.
- The openings of the collector baskets can be designed in different shapes according to the goods, f.ex. in a hexagonal or rectangular form. As standard they are designed in a round shape.

### Adjustable end walls

- By removable and adjustable intermediate walls the barrel can be divided into several usable segments. The adjustment of the intermediate walls is effected by a pressing stick resulting into a positive insert locking.

### Collector basket opening

- The largely dimensioned collector basket opening (opening angle 135°) makes it easy to fill the collector baskets.

### Barrel carriers

- torsion-free construction made of steel or stainless steel
- resistant to corrosion due to epoxy resin coating, pickled and passivated or rubberized
- individual carrier designs possible

### Transport bars

- transport bars for chain hoists or carriers
- motor current contact system in the carrier - optional

### Contact system

- standard blade contacts
- spring-loaded motor current contacts
- cleaning device for clean contact systems
- connecting rail for equipotential – optional
- further bars available on demand
- vast programme of standard designs

### Bearing

- liquid-tight plastic sleeve bearing



### Barrel drive

- SEW gear wheel motor
- protection varnish OS3
- special designs
- speed control regulation and swing control system
- brake – optional





## Rotating racks current-carrying and currentless

Our rotating racks are the perfect solution for components with unfavourable shapes like blind holes, undercuts or pockets in which air bubbles can arise. The goods are

separately treated in special devices or alternatively adapted in baskets to the rack. Therefore an equal treating is possible and damages are minimized.



## Rotating contact systems

Current-carrying rotating contact systems are another range of application which were designed for the treating of one or two parts maximum. These rotating contact systems are mainly used in the field of galvanofforming or hard chrome

processes, f.ex. when embossing rolls or piston rods are electroplated. Piece weights of several hundred kilograms are not uncommon here.

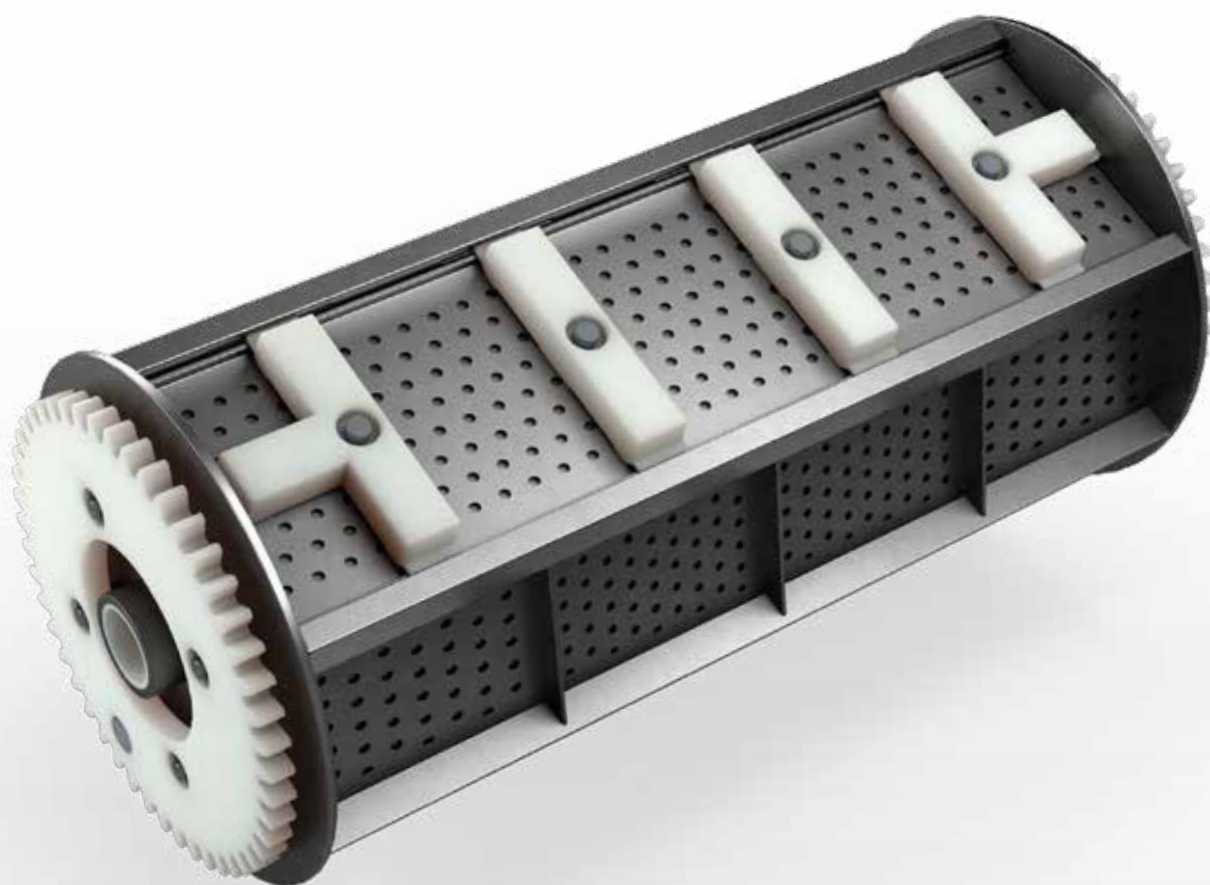




## Pickling and phosphating barrels made of stainless steel

These aggregates are manufactured according to customers' requests. The perforation can be chosen individually. Barrel carriers and protective covers are manufactured according to

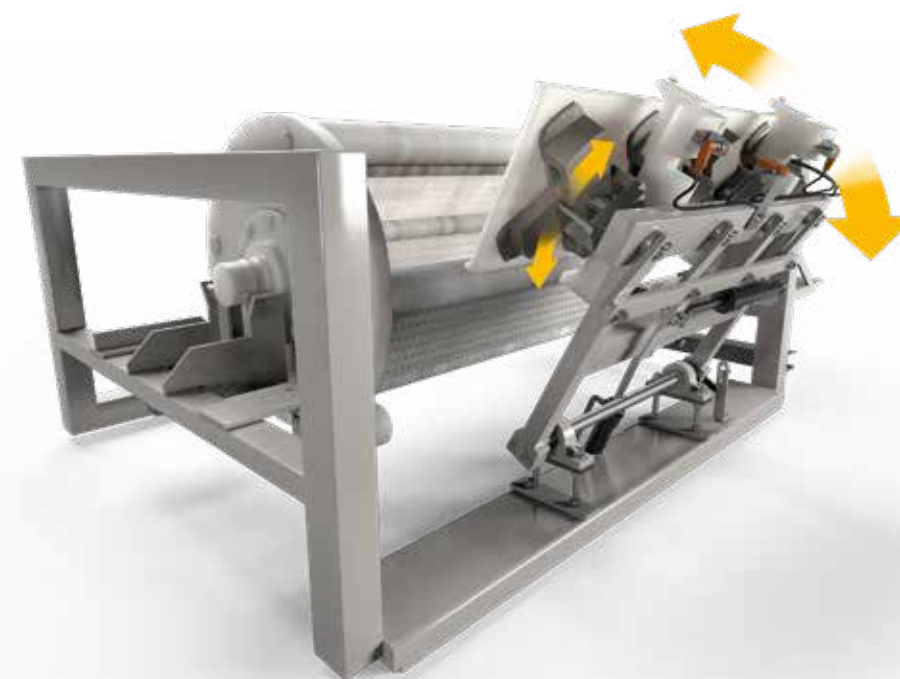
our standard programme. The barrel carriers and bearing bars are made of stainless steel. You can choose between 1.4301, 1.4401 or 1.4571.



## Automatic cover opening and closing station (DOS)

### Cover-opening process

The cover-opening device automatically brings the electroplating barrel into the loading and unloading position, prepositions itself and is then fine-positioned. As soon as this positioning is completed the actual cover-opening process begins.



Due to the extension of the lifting cylinder the cover-opening tools are tilted and grip into the recesses of the cover toggles. The design of the gripping tools guarantees a smooth gripping of the toggles and a reliable holding of the cover in the cover-opening device.

As the cover-opening tools are connected by a flat bar, an identical angle of inclination of each individual tool is guaranteed at any time.

After the cover has been lifted by the opening device, the device returns to the initial position together with the cover. The barrel can now be loaded resp. unloaded without hindrance.

Due to the simple design of this loading and unloading station the number of movements is reduced to a minimum. This results in a number of crucial advantages regarding cost-effectiveness, reliability and service life.

### Cover-closing process

The cover is closed in the same way as it is opened but in reverse order. The device always returns the cover reliably and precisely to the barrel opening.



## Electro-polishing barrel

When designing this innovative conception of an electro-polishing barrel we paid particular attention to the quality of the finished goods. Due to the electro-polishing barrel it has been possible for the first time to electropolish goods of a maximum volume of 8 litres resp. of a maximum weight of 25 kg with consistent premium quality.

### The advantages of this barrel at a glance

- careful processing using high-quality materials guarantees a long operating life even under extreme conditions.
- solid system construction suitable for the intended application
- a precise and tightly closing cover
- user-friendly operability and operation safety meeting even the highest demands due to the cover closing system
- stable bearings
- optimal electrolyte exchange and minimized carry-over loss by means of smooth, water-repellent material surfaces and gap-free transfers combined with a sophisticated perforation system

Due to the additionally developed control electronics a continuous speed setting as well as an oscillating operation are possible.

The liquid-tight metal sleeve bearings directly transfer the current onto the barrel body made of titanium or stainless steel. The special contact fluid in the inner part of the earing keeps the contact surfaces clean.

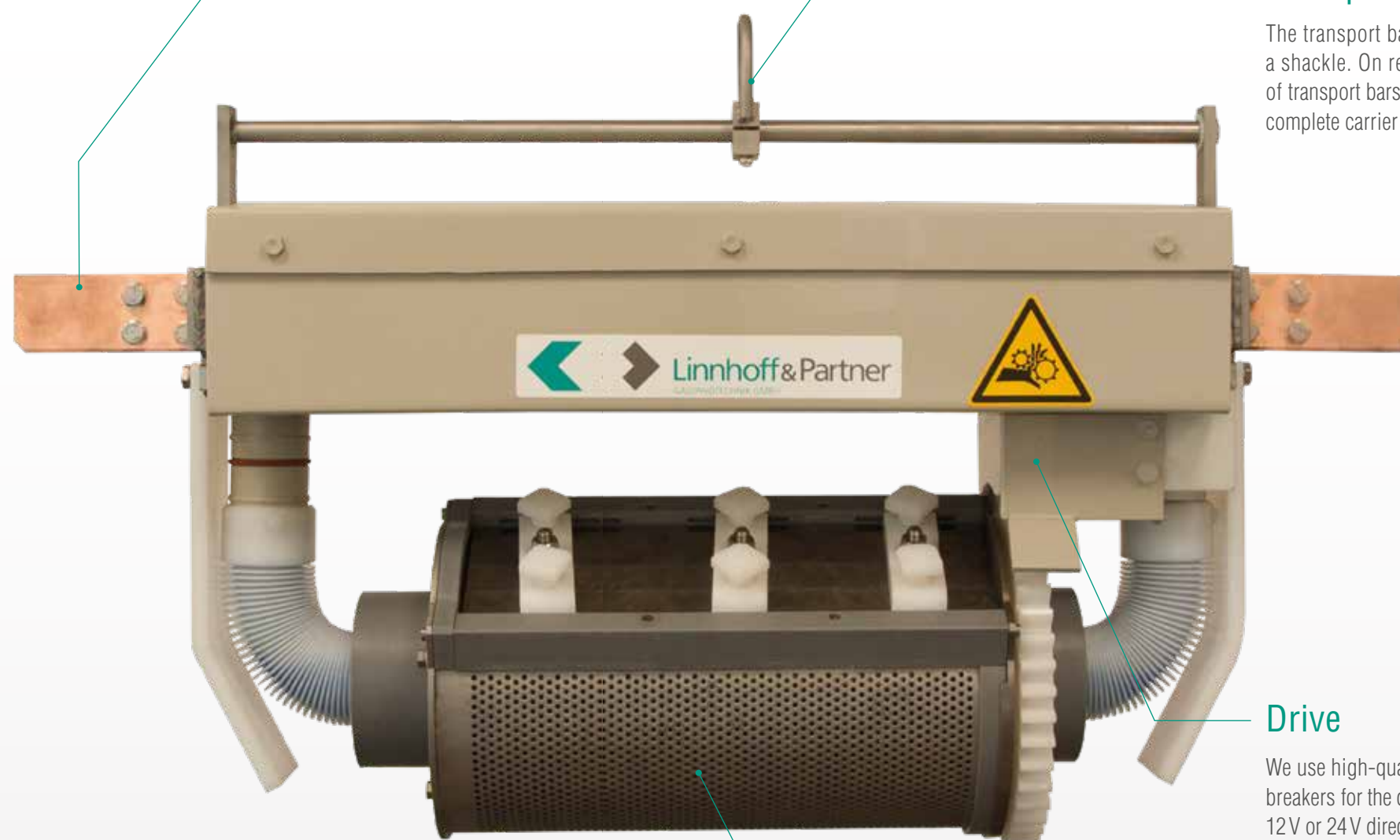
The double-walled barrel body and the double-walled central pipe are absolutely short-circuit resistant. One wall transfers the anode current, the other one transfers the cathode current.

### Contact support

For galvanic current transfer we usually use blade contacts made of copper which are also suitable for high currents.

### Transport bar

The transport bar for the electro-polishing barrel has a shackle. On request we can also deliver other types of transport bars. An adaptation of the bars or of the complete carrier is possible in most cases.



### Drive

We use high-quality gear wheel motors with circuit breakers for the drive. The motor voltage amounts to 12V or 24V direct current. Moreover, the barrel speed can be continuously adjusted at the aggregate.

### Barrel body

The barrel body is made of titanium and stainless steel 1.4571 and the current is transmitted via liquid-tight metal slide bearings. The special form of the cover guarantees a gap-free fitting. The cover can be opened and closed easily by means of the handy rotary toggle.



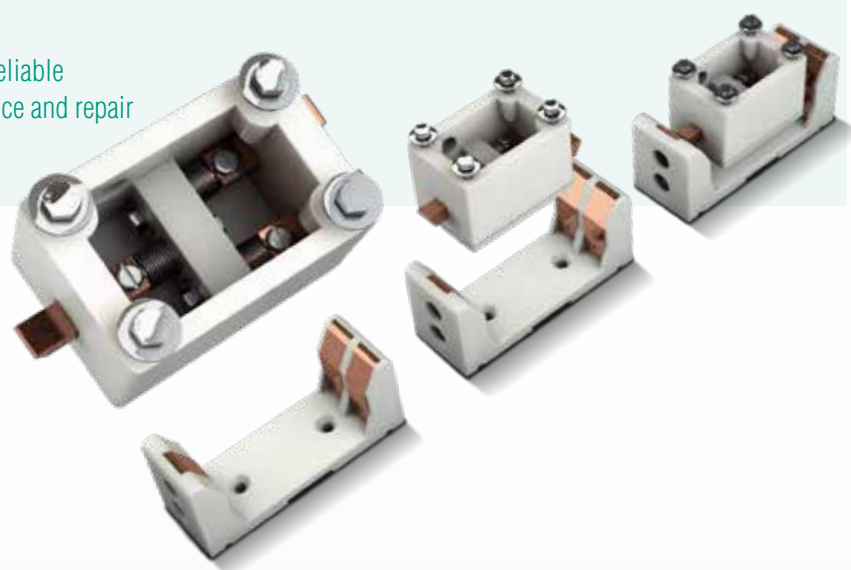


## Motor current contact

The motor current contact is an important element of a properly functioning barrel aggregate. Our motor current contacts have decisive advantages and ensure a trouble-free operation of your plant.

### Advantages:

- self-cleaning contact surfaces
- very high current transmission
- extremely robust and therefore very reliable
- construction convenient for maintenance and repair



## Plastic receptions

Plastic receptions are mainly manufactured from PE or PP. You can choose between our low-priced standard receptions or a version designed to your requirements.

Because of our 5-axis CNC centres we are also capable to manufacture complex shapes. A sample or sketch will do in most cases.

## Tube barrel body



This 'barrel within a barrel' can be used for galvanising small batches by simply placing the tube barrel body inside the existing barrel. The body is made of PP grey and is equipped with screws with stainless steel cap nuts as contacts. Different sizes are available. The length can be specified by you. Regarding the barrel body with an internal

diameter of 100 mm, the contacts are also fitted at the front side.

The standard perforation is round with a diameter of 6 mm. Special perforations and special forms are available on request.





## Gearwheels

Our gearwheels are completely manufactured by us, be it single pieces or small batch series. Our range varies from driving gearwheels for small barrel aggregates to groups of gearwheel series consisting of several parts.

They are mainly made from PE 1000, but it is also possible to manufacture them of PE 500, PP, PPs, stainless steel or many other materials. They can also be made combining plastic and metal.



## High current contacts & cleaning devices



Ideas for electroplating and high current!



## Surface contacts

Our surface contacts impress by their simple construction. Due to a solid welded construction made of high-quality stainless steel, they have a durable and trouble-free working life. The contact plates are pressed by insulated springs to the contact surfaces under high pressure

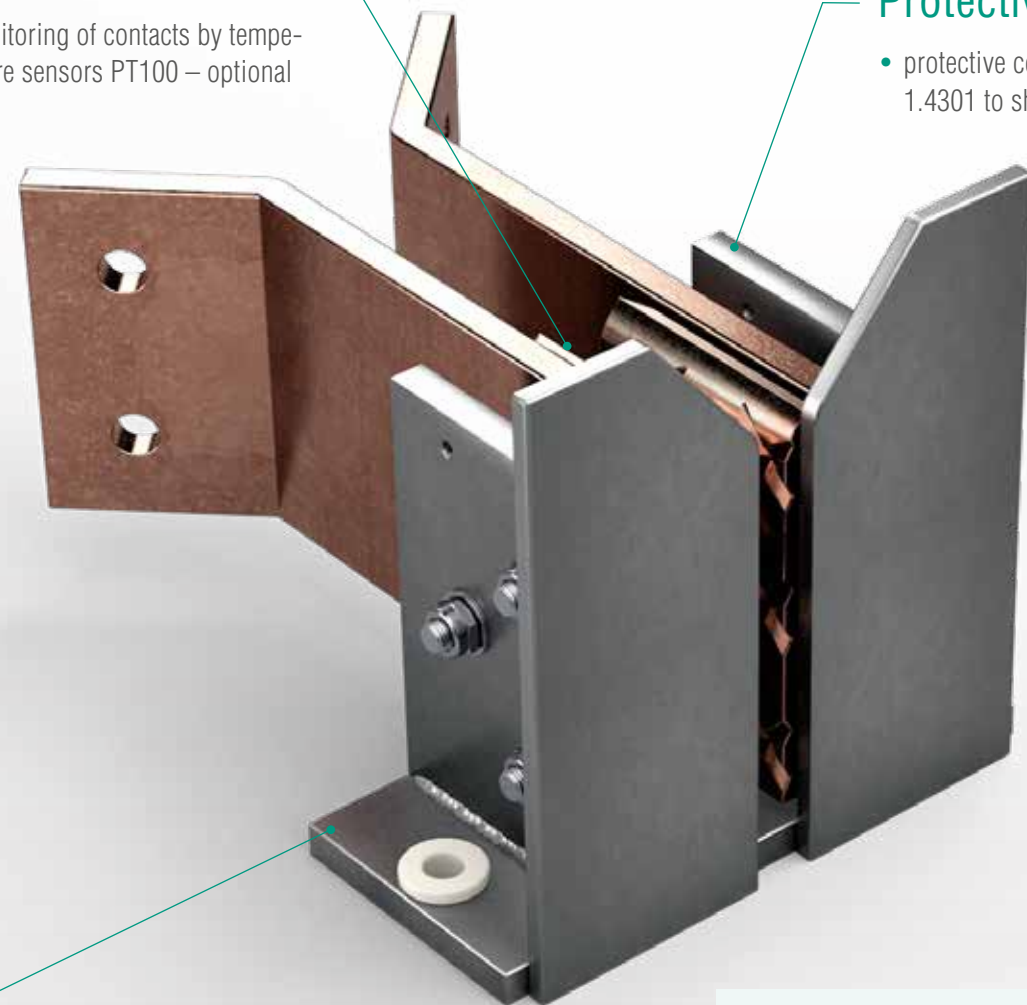
enabling an ideal current transmission. Connection is effected by means of simple connection cables directly onto the contact plates. Therefore no extra conductor lines are necessary when the goods are moved. They are solid, easy to maintain, cost-efficient and self-cleaning.

### Monitoring

- monitoring of contacts by temperature sensors PT100 – optional

### Protective covers

- protective covers made of 1.4301 to shield off falling dirt



1500 A

### Solid stainless steel construction

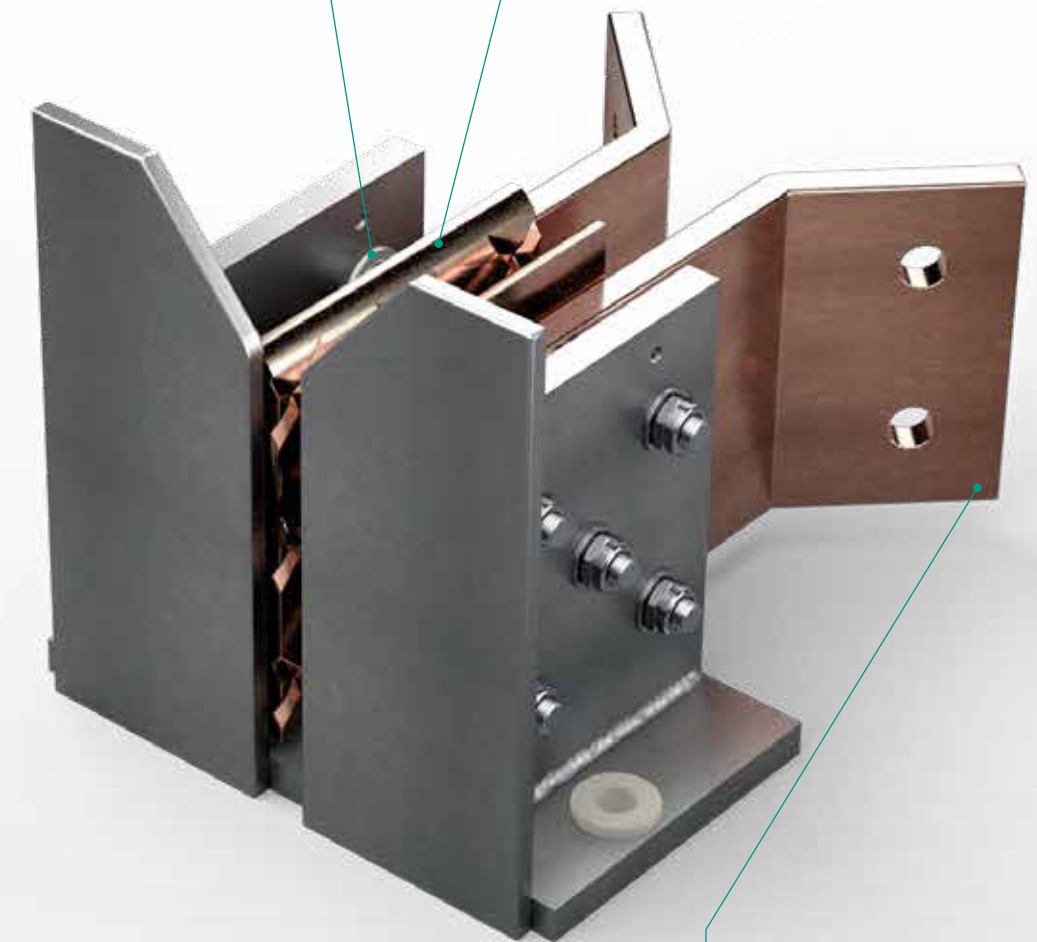
- support console made of 1.4301 with solid guide rails in form of a welded construction
- optionally made of 1.4571, coated or with additional guide rails made of PE

### Compression springs

- insulated compression springs made of stainless steel for constant pressure
- anti-corrosion coating - optional

### Replaceable contact plate

- easily replaceable contact plates with wiper grooves for self-cleaning when running in



3000 A

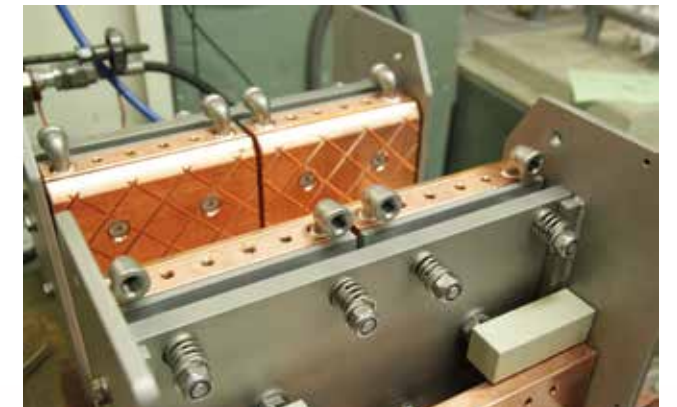
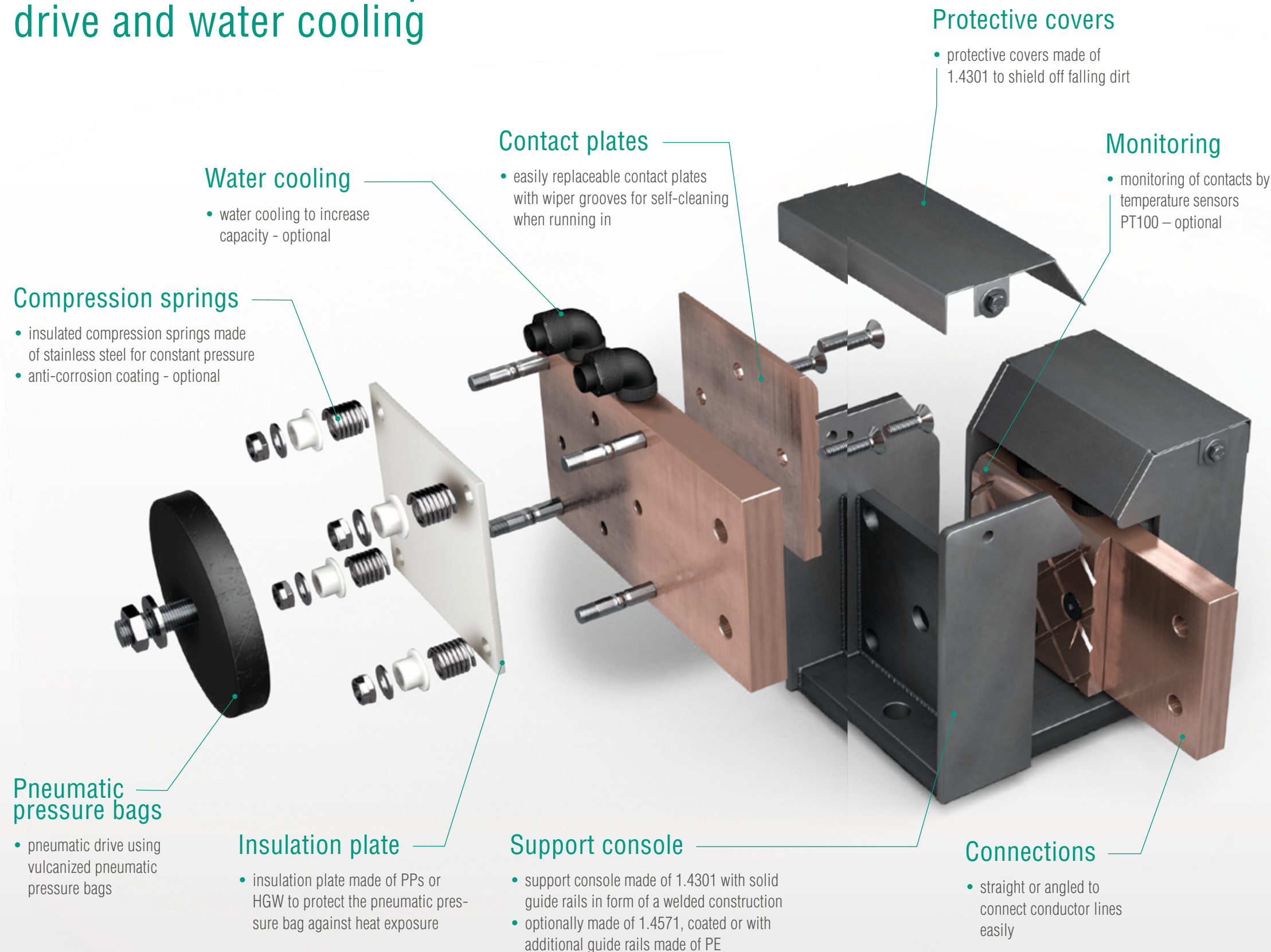
### Connections

- straight or angled to connect conductor lines easily



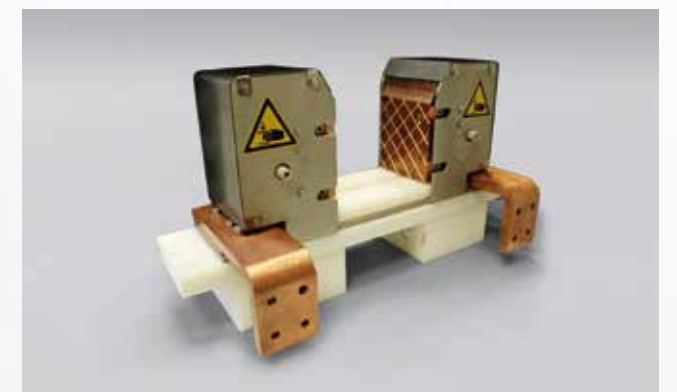


# Surface contacts with pneumatic drive and water cooling



## Water-cooled design

If you want to increase the power output of the surface contact, we can recommend the water-cooled design as it does not need more space. By using a water-cooled surface contact the maximum power output can be increased by up to 35 % depending on the cooling capacity. The water cooling is installed inside the connection plates. We also recommend installing PT 100 temperature sensors to monitor the contacts ideally. So a safe operation of the contacts is always guaranteed.



## Pneumatic design

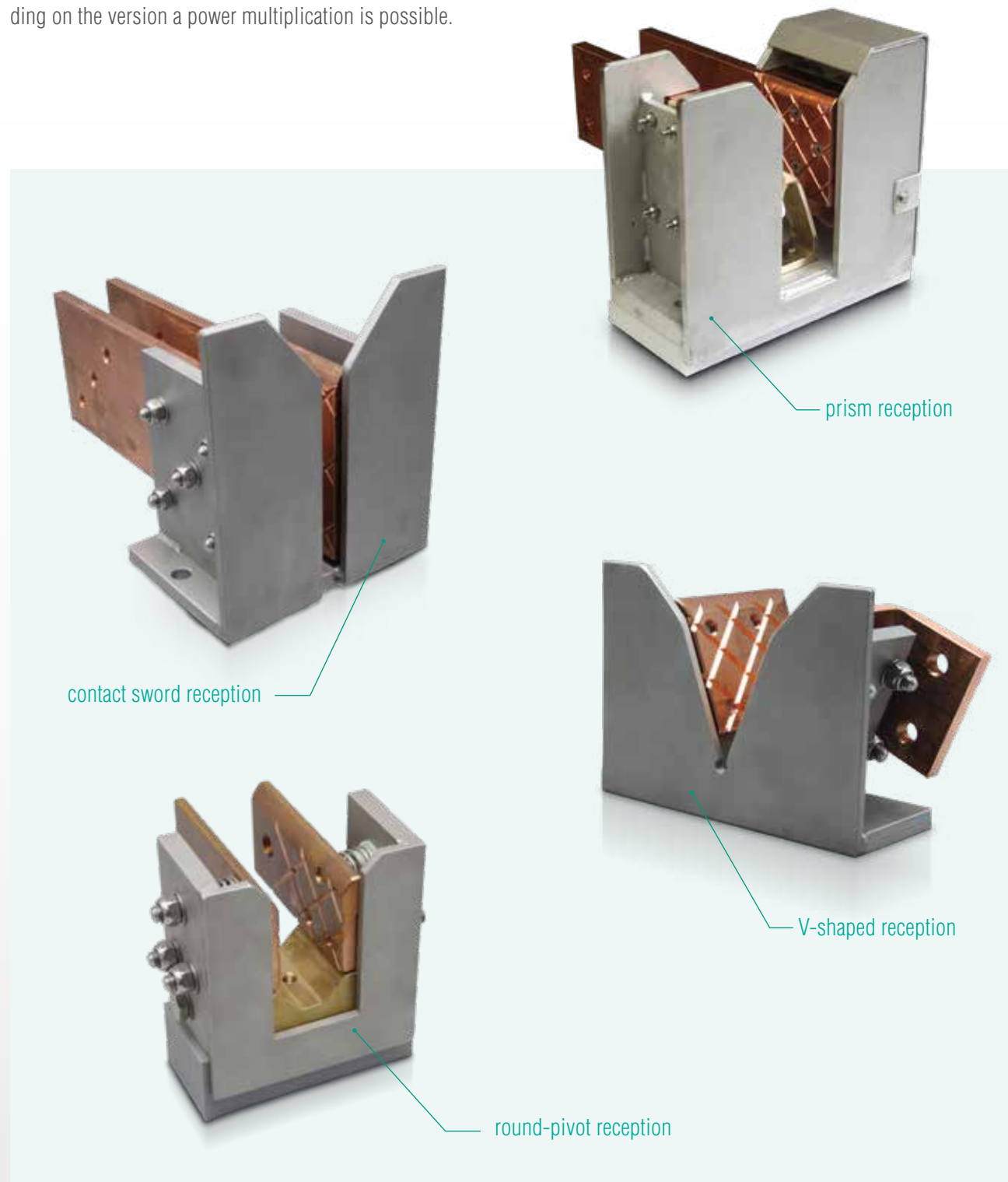
Pneumatic contacts are only applied when high currents, little space or low input weights present a challenge. The contact pressure is reached by using vulcanized pressure bags. There are hardly any limits regarding pneumatic surface contacts. You will often find them with an output of 20 kA and more. Due to an additional instalment of a water cooling the power output can be increased at any time. The costs are relatively high, however, you gain a maximum process reliability.





## Easy refitting of existing contact system

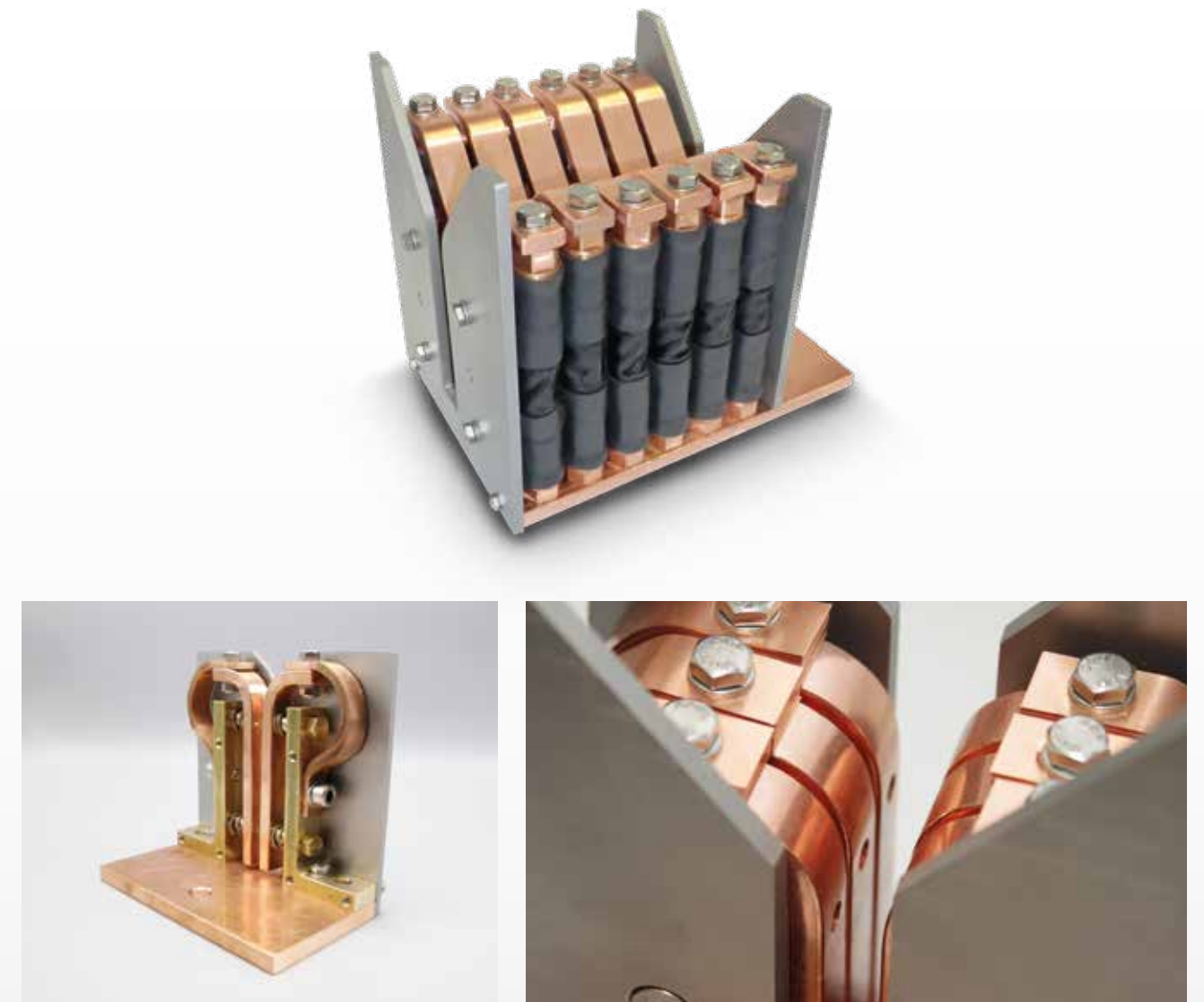
Each contact system can be individually adjusted to any installation. All our systems are tested in practice. Depending on the version a power multiplication is possible.



## Finger contacts

Finger contacts with several spring-loaded single fingers enable a good contact even when the contact surface at the carrier is not smooth. Ideally the contact fingers are

equipped with wiper grooves to clean off loose dirt when the carrier enters. To tie the movable elements to the basic body foil tapes are used.



## Pneumatic finger contacts

Using a pressure bag for the pneumatic finger contacts it is possible to increase the contact pressure in order to reach a better contact. Especially in existing installations the contact

surface of the carrier is often uneven. In this case it is advisable to opt for contacts with pneumatic fingers.



## Special designs and receptions

### Bolt contacts

At the early stages of automation technology, bolt contacts were often used in electroplating plants. Today, they are still used for contacting extendable anodes and in electrolytic cells. The base body is made of brass and can be mounted directly onto the connecting rail. So unnecessary connections are no longer required.

Inside the contact there are spring-loaded bolts linked to contact strips. The power output of the maximum current depends on the number of contact bolts. Each bolt is capable of transferring approx. 400 A. In most cases, however, we recommend to apply a cost-efficient high current surface contact.



### Sliding contacts

Sliding contacts are often applied in the conductor board electroplating industry because you will only find low insert weights there. Using sliding contacts requires a high accuracy when inserting and a precise position of the

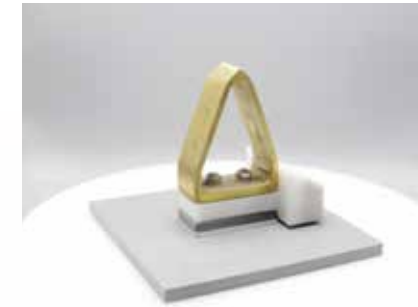
contacts. Due to their limited compensating possibilities, they are not suitable for vats with 3 or 4 contact areas. Sliding contacts as well as brass receptions do not have a 'self-cleaning effect'.



### Brass receptions

Brass receptions have been in use for more than 100 years. In the early years of electroplating only bent spring contacts were used next to brass receptions. In case of lower currents of up to 500 A these contacts are still sufficient today.

Low costs and good mechanical qualities are advantageous. Unfortunately, they are not self-cleaning and are therefore subject to constant care.



### Special contact systems

We do not produce our contacts only for the electroplating industry. Special designs are also applied in maintenance facilities for trains, quick-change systems for pressing tools, vacuum furnaces, test facilities, recycling plants and special plants for astronautics.

Wherever high currents have to be transferred safely, our special contact systems are the fitting solution. In this respect each project will be intensively planned together with you until a useful and working solution has been found.





## Cleaning devices

*'Beginners often overlook to keep the wires and contacts clean.  
But this is of vital importance for the power circuit and thus for the plating process.'*  
Dr. W. Pfanhauser, Galvanotechnik, 1928

Although there was already talk about this 90 years ago, it is still being neglected many times today. Only clean contacts can work efficiently.

To support your staff, we recommend cleaning devices at the rinsing tanks. These cleaning devices work independently of the plant operator. The contact surfaces of the carrier are cleaned during each cycle.

The simple and solid construction pays off here, too. The brushes can be changed individually. Cleaning devices can be obtained for each type of contact (sword, pivot, prism, etc.) In most cases the cleaning devices can easily be changed for the existing plastic receptions.

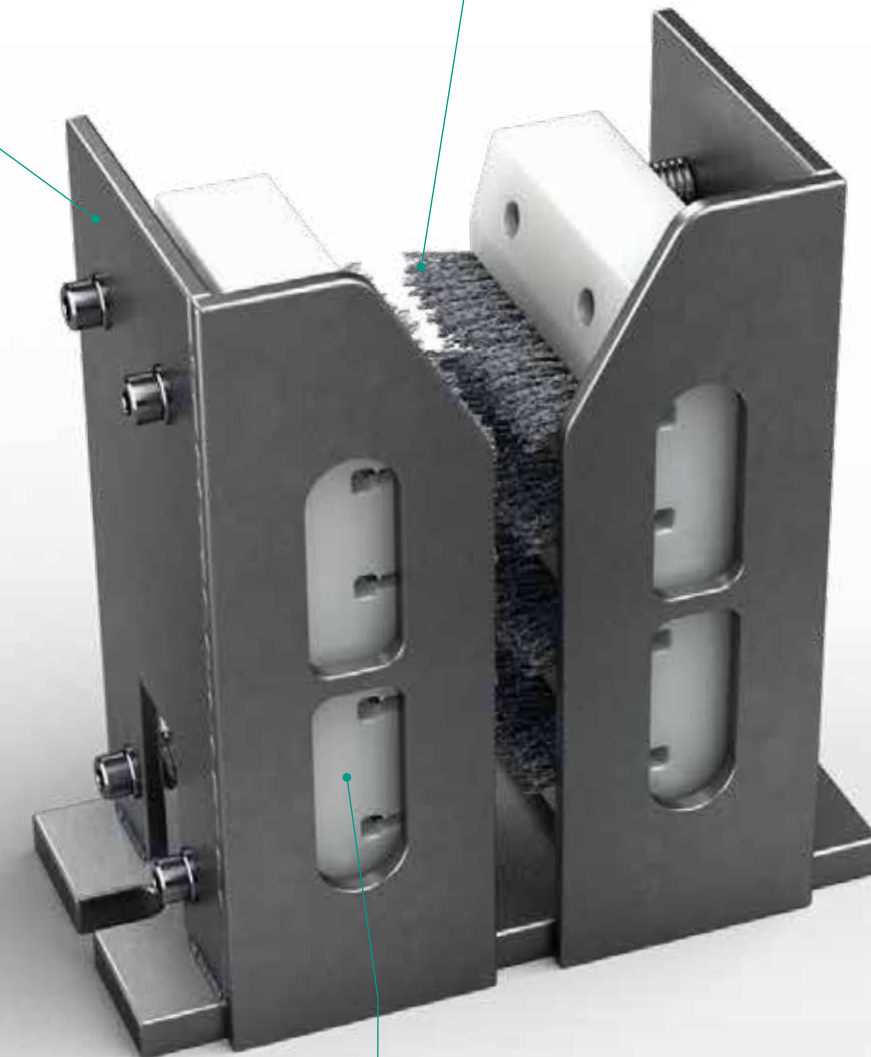


### Solid inox construction

- made of 1.4301
- hole pattern of the fixing holes according to your demands

### Individually changeable strip brushes

- The strip brushes can directly be changed at the tank, it is not necessary to remove the cleaning device.



### Spring-loaded holding blocks made of PE 1000

- for mounting the strip brushes
- to receive the strip brushes the holding blocks can be adjusted via the inner hexagon screws





## Accessories

### Connecting cables and conductor lines



We recommend using highly flexible connecting cables when connecting high current contacts or rectifiers. We produce these in different designs and cross sections according to your demands. These cables can be produced either of crimped copper braids and connecting flange or cable lug. According to your range of application and operation site the connecting cables are equipped with protective hoses of various materials like PVC, silicone or PUR before they are tightly crimped. We gladly advise you which cable suits your needs best.

### Plastic receptions

Our plastic receptions are mainly manufactured from PE or PP. You can choose between our low-priced standard receptions or a version designed to your requirements. Because of our 5-axis CNC centres we are also capable to manufacture complex shapes. A sample or sketch will do in most cases.



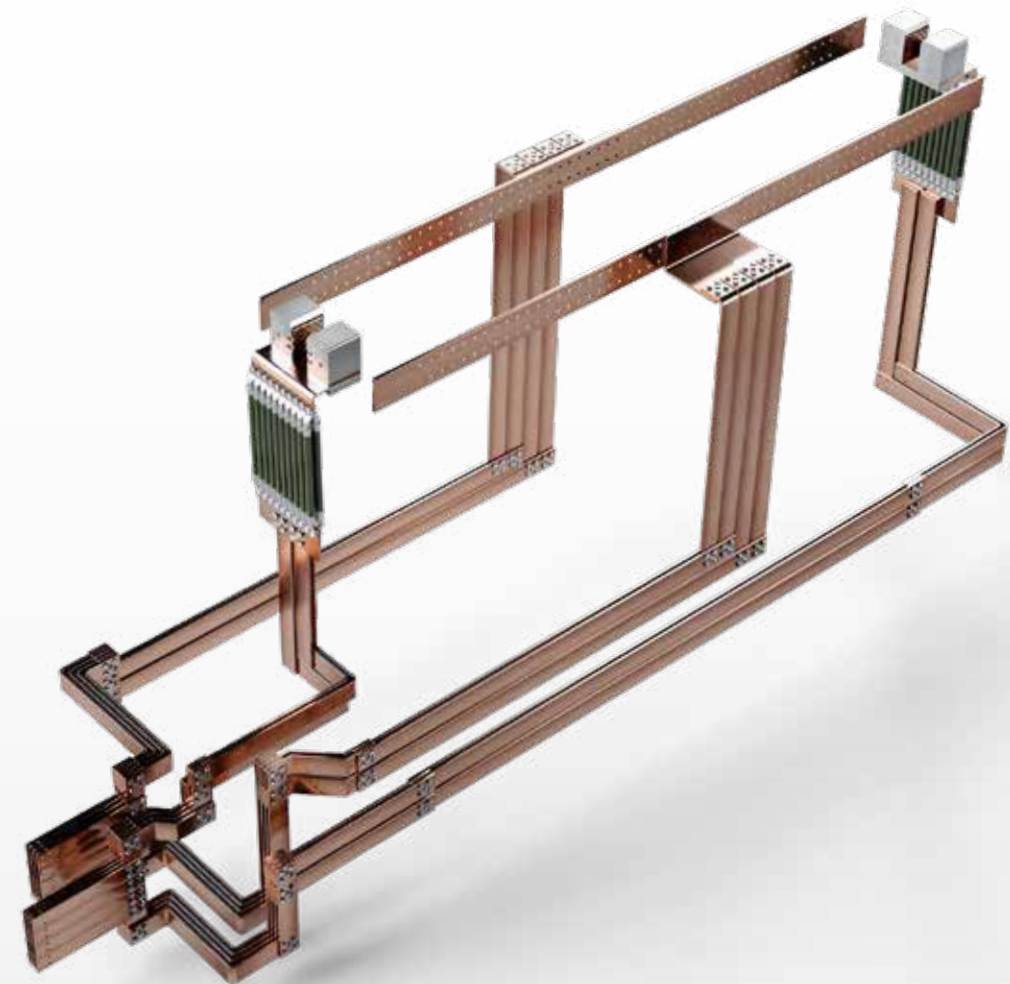
### Copper rail connections

Making use of modern and professional piercing and bending technology we are able to produce and install copper rail connections on your premises. The raw material will be cut, pierced and bent on-spot to guarantee a precise adjustment to the operation site.

On request all copper rail connections will be delivered including assembly material, insulation and coverings.

Normally it is also possible to modify existing connections or exchange individual segments without problems.

Together with our contacts or module components you will receive everything for the way from the rectifier to the reception from one provider. Thus a maximum compatibility can be expected.



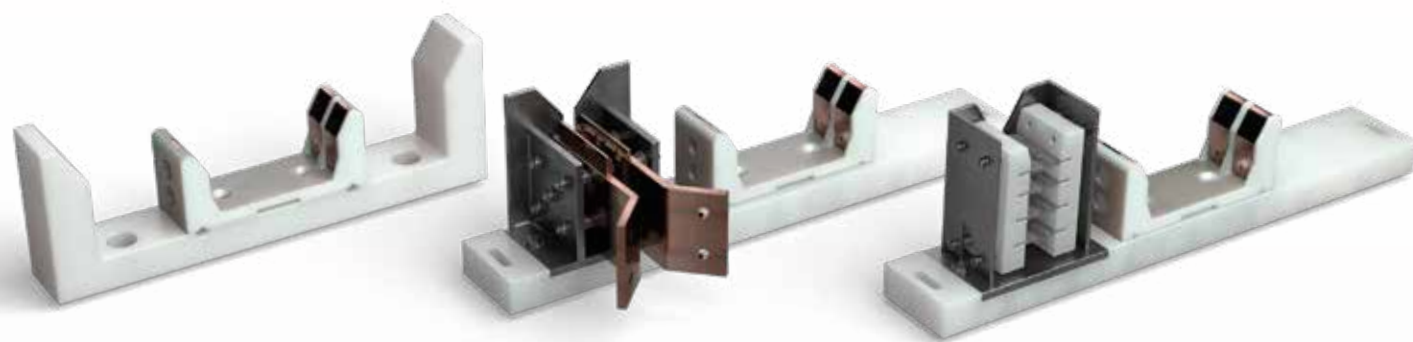


## Accessories

### Module components

Module components consist of ready pre-assembled tank rim equipment. This means that (plastic) receptions, high current contacts, motor current contacts and cleaning devices are assembled onto plastic plates according to your

requirements. These module components can be fastened with screws or welded as a unit. So a troublesome arrangement of all single components is avoided.



### Anode baskets

We deliver anode baskets in various sizes and designs. Their shape and way of fixing will be made according to your needs. We can also design them easily according to freehand sketches and samples.



### Cable contacts

Our long-lasting contact cables are made of PUR sheathing as standard. This sheathing especially made for us is available in different diameters and cross sections. It is also possible to produce them of PVC, silicone and neoprene. Our contact heads are available made of steel, brass, stainless steel or

special materials like titan or copper. They can be designed in various versions: hollow, screwable, continuous or further designs. Ask for personal advice to enhance the durability of this item subject to wear.



### Rack technology

Next to the classic high current contacts and barrel aggregates we also offer conventional components of rack technology. They comprise rack clips with pressure frame 'Lipfix', anode clips, rack fastener and holding blocks. We provide you with all necessary components for your carriers. You will also find special designs, small series and single units in our programme. Contact us and allow us to advise you.





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