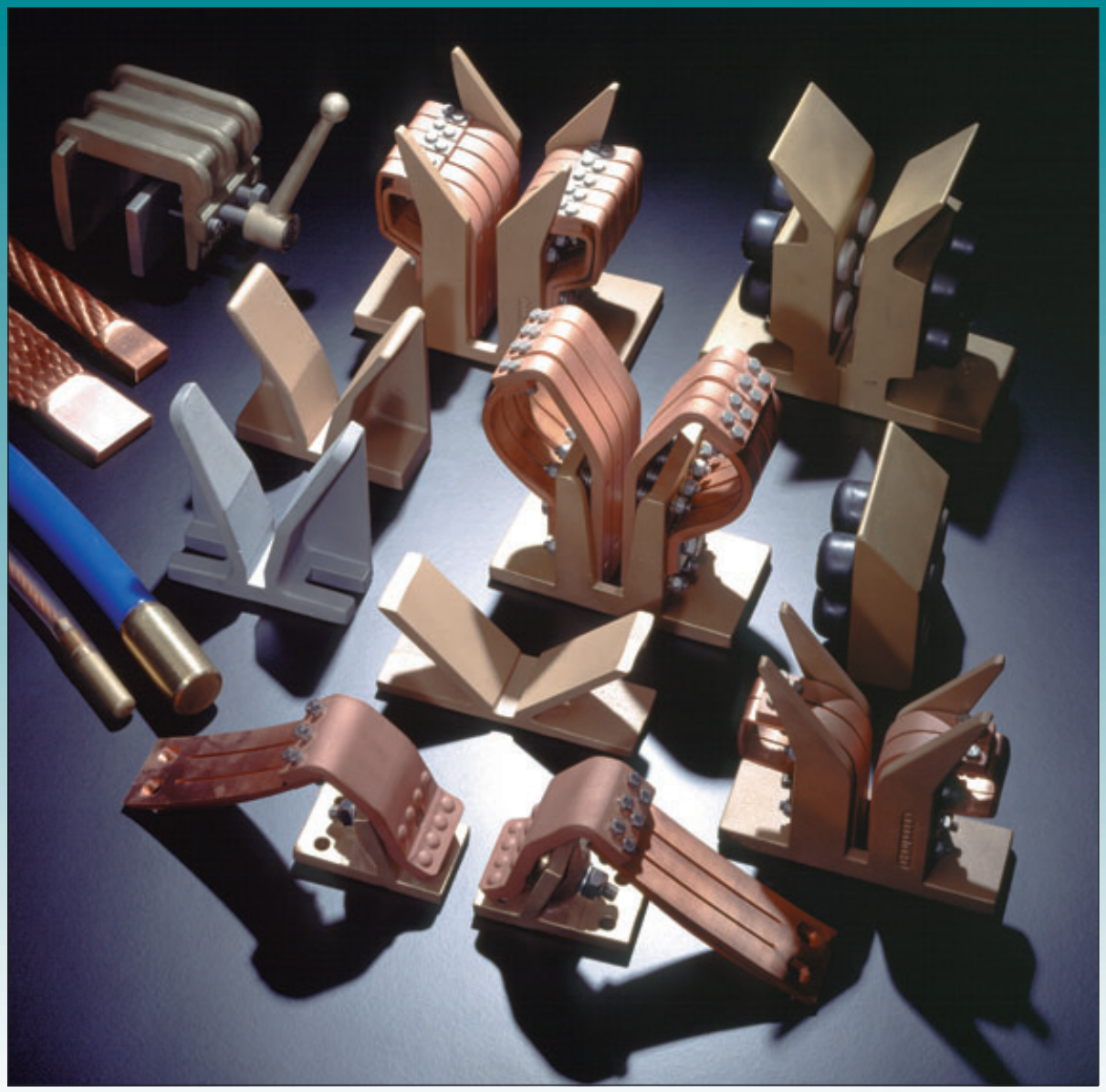
Contact-Systems and Accessories for Anodising and Electroplating Equipment



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Factory View Neuenkamper Strasse

Factory View Lenneper Strasse

Aerial photograph of our factory

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Quality and constructive know-how backed by modern production technology ...

Construction

+

Production

+ Quality Assurance

=

Quality Products

... provide the user with a wide range of contacts and current transfer elements, fine tuned to the respective requirements.

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High Current Contacts for Galvanising Equipment
Much emphasis is being placed on the quality of finishing and plating galvanising and electroplating. These increasing requirements are simultaneously combined with the demands for inexpensive methods and rational, low-maintenance production procedures. Every component of a plating system must therefore be equipped to meet these prerequisites. Weak points which can be the cause for repairs or system down-time or that could lead to plating problems must be avoided or eliminated. A major prerequisite for optimal processing is that the current required must be transferred to the items in the vat with as little loss as possible. This factor clarifies the emphasis on transfer mediums and contacts within the system. After a decade of experience in the construction and production of high current contacts, druseidt has gained an understanding of this statement and the problems that occur in these applications. The experience gained, combined with the most up-to-date construction and production systems have made our company into a competent partner for system manufacturers as well as for end users. We offer a complete service palette including consulting and planning, production and delivery right through to installations or moving and reinstalling at the customer site. A full selection of contact systems as well as a multiple of accessories and electrical transfer elements for anodising and galvanising equipment is found in this catalogue. In addition to our extensive standard products, we offer customer specific solutions which are adapted especially for your requirements.

Some Features of Druseidt High Current Contactors
Contactors used around tanks in galvanising or anodising operations are subject to high levels of electrical, mechanical and sometimes chemical loads. For long lasting operation, these components must retain low transfer resistance to ensure current dependent tank parameters and also to avoid energy loss. Based on these requirements, druseidt has been developing and producing various contact systems which enable economic energy use and are also suitable for fully automatic and maintenance free operation.

The following features make druseidt contact systems stand out:

- Direct current transfer from the contact to the bus-bars by utilising large surfaces and a high number of current transfer points.
- High conductivity with small installation space.
- Stable construction which meets mechanical demands.
- Higher contact pressure but still effortless mounting on bars (e. g. with its own weight).
- Contacts can be protected from aggressive elements with the use of an A4 stainless steel protective cover. This also gives the unit a more solid mechanical structure.
- Different contact systems, self tightening as well as pneumatic, are constructed modularly. This allows the simple exchange of worn out parts. Depending on the layout of the system, existing situations can be changed or updated according to requirements.
- Fast and inexpensive installation and deinstallation as well as quick and easy part replacement.
- Maintenance friendly construction.

We also produce contact systems which enable problem free clamping for damaged or stretched bus-bars. This allows you to modernise your older systems, e.g. in anodising or hard chrome systems, without having to replace existing work rods.

Selecting the Suitable Contacts and Current Transfer Elements
Current transfer elements in the galvanising branch are bombarded with mechanical and chemical stress as well as the electrical load. In order to choose proper components for the respective job, these criteria must be taken into account. **The technical data contained in this catalogue, especially the data on current load, is based on normal system operation and values based on experience in practise. These data are not to be assumed without consultation for all applications and instances.**

In order to offer the best possible current transfer solution for your individual application, please contact us. Our support professionals will be glad to provide consultation to support your plans.

The measurements in this catalogue have been determined with the greatest care and are updated continuously in our documentation. Because we continuously update our products however, we reserve the right to make technical changes as well as changes to measurements and formats after print. In case of any confusion, the values in our written confirmation apply.

Remscheid, March 2000

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High Current Contactors for Work Rod Systems

High Current –Contact Saddles 250 - 3000 A
One Piece Standard Version

A proven druseidt contact system for decades. Technically up-to-date and continuously under development. Supplied either as one piece standard contact for a bus-bar thickness of 10/15 or 20 mm or as a ready-to-install contact unit complete with base, i.e., integrated power connection bar or angle and insulation plate. Contacts with base are suitable for immediate installation on the tank frame. In order to maximize the life-span of the contacts and to minimize repair and down times, we recommend using protective covers. All druseidt protective covers are made of non-rusting and acid resistant A4 stainless steel and protect the contact from acid and alkaline spillage. Protective covers used in heavy duty applications also have an integrated 10 mm stainless steel mounting guide and are recommended especially when using heavier bus-bars. The mounting guide catches the bar securely making it easy to position properly. If you are using the normal protective cover or no cover, an alternative is to install a mounting guide made of red brass, afterwards (Part No. 50732). druseidt contact saddles provide the following advantages and enable the least amount of current loss to the bus-bars and tank contents when the system is planned and utilized professionally.

Advantages/Construction Features

Self-tightening: Insertion of bars using their own weight and therefore suitable for fully automatic system operation.

Self-cleaning: Contact surfaces are rubbed clean while the bars are inserted.

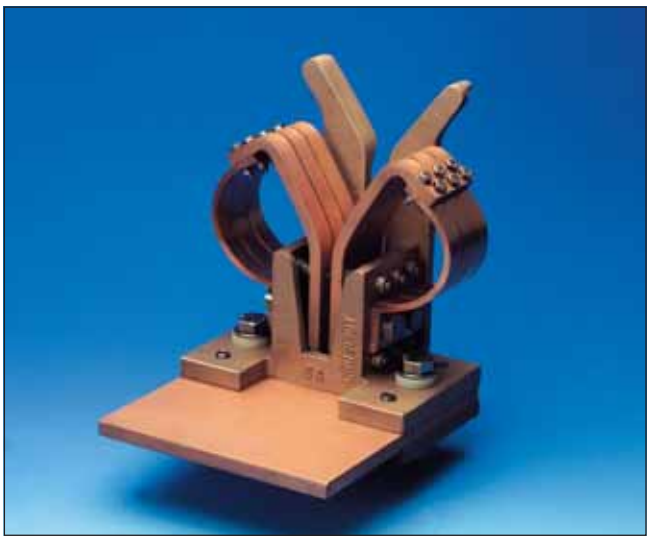
Conductivity: Contact saddles and foil package are made of E-Cu with guaranteed conductivity.

Robust: Stable work rod construction made of red bronze as well as stainless steel protective cover.

Compact: Minimal installation area even for high current.

Maintenance Friendly: Simple exchange of individual parts. Produced according to modular principle. Complete replacement contact elements or individual foils can be simply exchanged.

Contact Saddle- Standard



Contact Saddle – Installation-ready with base and mounting guides

Contact Saddle with Protective Cover

Replacement Contact Elements / Replacement Foils

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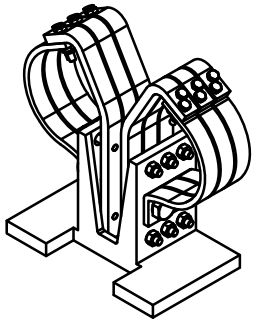
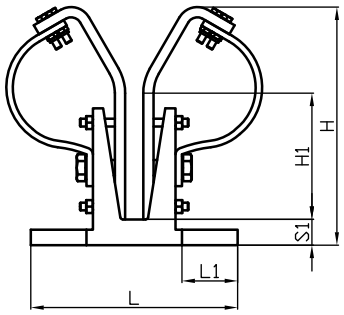
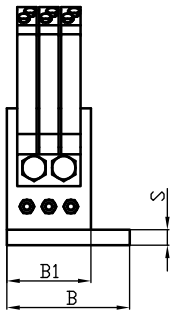
High Current Contact Saddles 250 – 3000 A
One Piece Standard Version







Part No. Contact block complete	Part No. Contact block with base	Part No. 1 set Replacement contact elements. Prefabricated	max. load	Suitable bus-bar height mm	Number of contact fingers 15 x 8 mm	Dimensions mm L	L_1	B	B_1	H	H_1	S	S_1	Weight kg/item. without base
50235	**50390**	**30620**	250 A	40 - 60	4	160	35	75	45	150	60	10	20	2,90
17080	**17120**	**17160**	250 A	80 - 120	4	160	35	75	45	180	85	10	20	3,10
50245	**50400**	**30622**	500 A	40 - 60	6	160	40	95	65	150	60	12	20	4,80
17085	**17125**	**17165**	500 A	80 - 120	6	160	40	95	65	180	85	12	20	5,00
50265	**50420**	**30626**	1000 A	40 - 60	6	160	40	95	65	150	60	12	20	5,20
17090	**17130**	**17170**	1000 A	80 - 120	6	160	40	95	65	180	85	12	20	5,40
50285	**50440**	**30630**	1500 A	40 - 60	6	160	40	95	65	150	60	12	20	5,60
17095	**17135**	**17175**	1500 A	80 - 120	6	160	40	95	65	180	85	12	20	5,80
17100	**17140**	**17180**	2000 A	80 - 120	8	160	40	80	-	180	85	12	20	6,80
17105	**17145**	**17185**	2500 A	80 - 120	10	195	50	100	-	180	85	14	20	8,00
17110	**17150**	**17190**	3000 A	80 - 120	14	230	55	135	-	180	85	16	20	13,50
17115	**17155**	**17195**	3000 A	100 - 150	14	230	55	135	-	210	110	16	20	13,60
50315	**50470**	**30636**	3000 A	120 - 200	14	230	55	135	-	240	135	16	20	13,70

Accessories/Replacement Parts

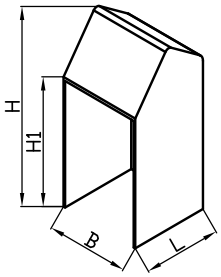
50732 1 Piece installed mounting guide
17198 Replacement foil, Type – 2 Fold
17199 Replacement foil, Type – 3 Fold

Part No. 30690 Replacement spring – Stainless steel, Standard
Part No. 30691 Replacement spring – Stainless steel, Heavy Version

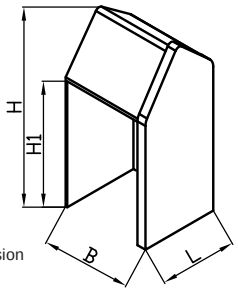
Note: All contacts are built modularly with E-Cu foils screwed into place so that individual foils can be replaced or the complete contact element (contact finger and fixing materials). Contacts for a bus-bar thickness up to 20 mm are delivered as a one piece module. For heavier bars, the contacts can be delivered in two halves. **When ordering, please indicate the thickness and height of the bus-bars.** For lighter bus-bars (weight less than 50 kg), please contact us again, because the contacts must be set up accordingly.

Protective Cover – A4 Stainless Steel
Suitable for Contact Saddles 250 A – 3000 A

Normal Version



Heavy Duty Version



Part No. Cover Normal	Part No. Cover Heavy duty	Suitable for contact block Load	Part No.	Dimensions mm L	B	H	H_1
30655	**30655 vst**	250 A	50235	85	50	165	110
30656	**30656 vst**	250 A	17080	85	50	195	140
30657	**30657 vst**	500 - 1500 A	50245/65/85	85	70	165	110
30658	**30658 vst**	500 - 1500 A	17085/90/95	85	70	195	140
30668	**30668 vst**	2000 A	17100	85	85	195	140
30670	**30670 vst**	2500 A	17105	95	105	195	140
31672	**31672 vst**	3000 A	17110	115	140	195	140
32672	**32672 vst**	3000 A	17115	115	140	225	170
30672	**30672 vst**	3000 A	50315	115	140	255	200

Note: Heavy duty protective covers have an additional 10 mm stainless steel guide and are recommended especially for heavier bus-bars. The height of the heavy duty version is 15 mm more than the normal version and the width is 8 mm more than that shown in the table.

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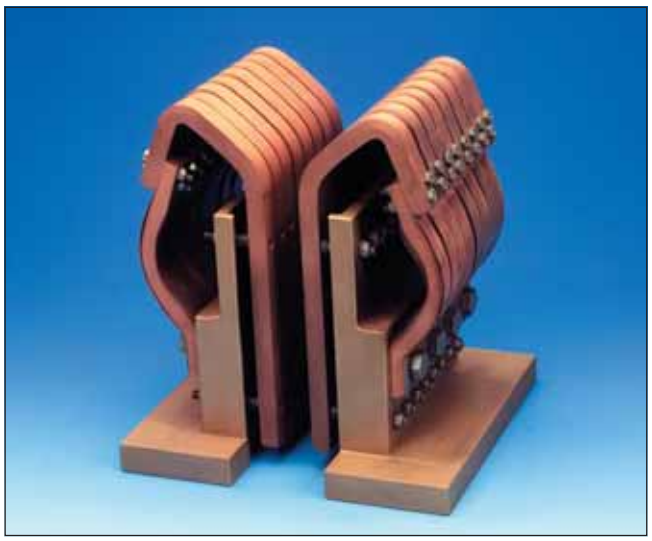
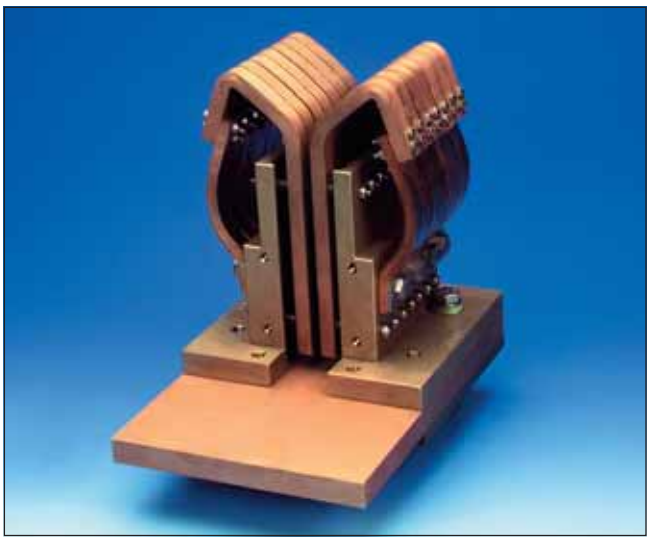
High Current Contact Saddles 4000 – 14000 A
Two Piece Model

The 4000 A and up range, proven for many years. The standard version is supplied as a contact pair, i.e. delivered in two non connected halves. This allows the contacts to be set individually according to the bus-bar thickness for installation. The installation distance of the contact halves must be less than the thickness of the bus-bar (depending on the contact block or weight of the bus-bar 4 – 6 mm; consultation required). Inserting the bus-bar works with the bar's own weight which makes these contacts very efficient for fully automatic operation. Additionally, the bars slide cleans the surface of the contact areas. All contact block sizes can also be delivered as a complete ready-to-install unit with base consisting of a mounting plate and connection bar (flat or angled) as well as the insulation plate. To increase the mechanical stability and to protect the unit against acid and alkaline spillage, we recommend our stainless steel protective covers. The contact units are very maintenance friendly being built according to a modular principle. Complete contact elements (contact fingers including installed foils and fixing accessories) as well as individual replacement foils are available as standard replacement parts.



Standard Version 6000A



Ready Assembled Contact Block with Base

Contact Block with Protective Covers

Replacement Elements and Foils

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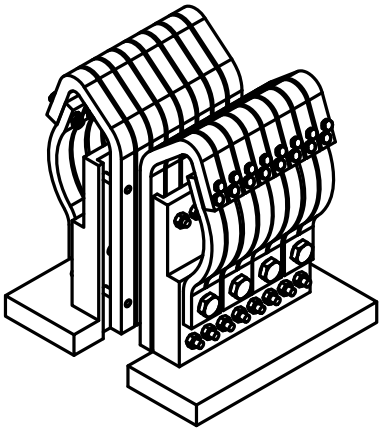
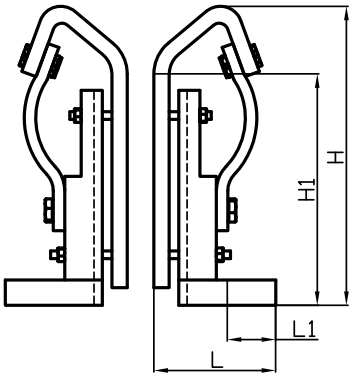
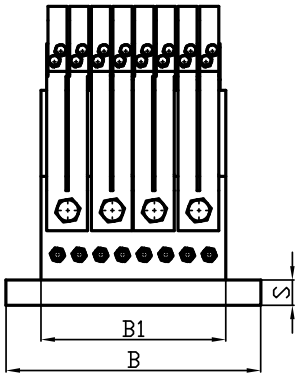
High Current Contact Saddles 4000-14000 A
Two Piece Model







Part No. Contact block complete	Part No. Contact block with base	Part No. 1 set Replacement contact elements Prefabricated	max. load	Suitable bus-bar height mm	Number of contact fingers 15 x 12 mm	Dimensions mm L	L_1	B	B_1	H	H_1	S	Weight kg/piece without base
20011	**17231**	**17371**	4000 A	160 - 250	14	95	35	185	130	240	180	20	21,70
20022	**17241**	**17381**	6000 A	160 - 250	16	95	35	200	145	240	180	20	25,80
20033	**17251**	**17391**	7000 A	160 - 250	20	95	35	230	175	240	180	20	30,20
20044	**17261**	**17401**	8000 A	160 - 250	24	95	35	270	215	240	180	20	34,00
20055	**17271**	**17411**	10000 A	160 - 250	32	95	35	330	275	240	180	20	43,20
20066	**17281**	**17421**	12000 A	160 - 250	40	95	35	390	340	240	180	20	51,10
20077	**17291**	**17431**	14000 A	160 - 250	48	95	35	440	390	240	180	20	59,70

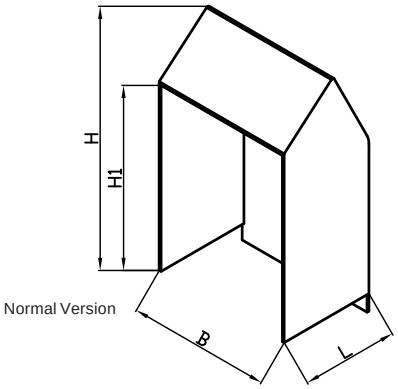
Accessories/Replacements

30702 1 Piece installed mounting guide
17198 Replacement foils, Type – 2 fold
17199 Replacement foils, Type – 3 fold

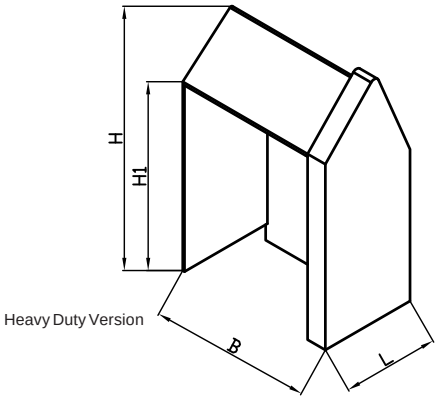
Part No. 30691 Replacement spring – Stainless steel, Heavy version
Part No. 30692 Replacement spring – Stainless steel, Heavy duty version

Note: All contacts are built modularly with E-Cu foils screwed into place so that individual foils or the complete contact element (contact finger with foils and fixing materials) can be replaced. **When ordering contact blocks with a base, please indicate the bus-bar height and thickness.**

Protective Covers – A4 Stainless Steel
Suitable for Contact Saddles 4000-14000 A



Normal Version



Heavy Duty Version

Part No. Cover normal	Part No. Cover heavy duty	Suitable for contact block Load	Part No.	Dimensions mm L	B	H	H_1
17301	**17301 vst**	4000 A	20011	95	135	255	205
17311	**17311 vst**	6000 A	20022	95	150	255	205
17321	**17321 vst**	7000 A	20033	95	180	255	205
17331	**17331 vst**	8000 A	20044	95	220	255	205
17341	**17341 vst**	10000 A	20055	95	280	255	205
17351	**17351 vst**	12000 A	20066	95	345	255	205
17361	**17361 vst**	14000 A	20077	95	395	255	205

Note: Heavy duty protective covers have an additional 10 mm stainless steel guide integrated and are especially suitable for use with heavy bars. The heavy duty version is approximately 20 mm higher than the figures shown in the table and approximately 8 mm wider.

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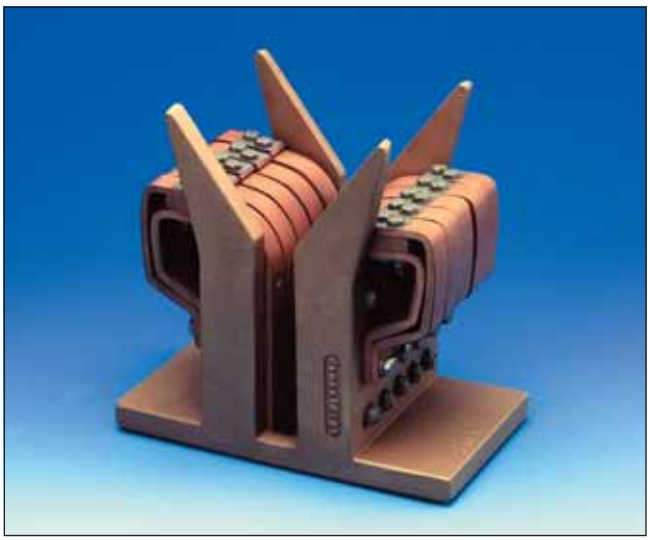
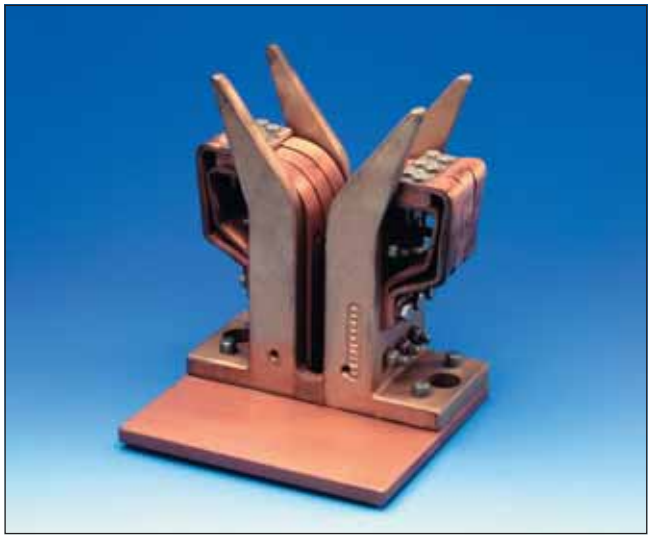
High Current Contact Saddles 250 - 4000 A
One Piece Model
with Integrated Guides

This range of contacts is a further development based on our standard version. The construction of the contact finger has been modified with an easy exchange foil package which in cases decreases the size of the unit. Furthermore, guides have been integrated directly in the main module on each side. Besides technical improvements, this also creates an overall less expensive solution as well. These contacts are delivered as a one piece model for bus-bar thickness 10, 15 or 20 mm. Although the installation size of the unit is smaller, parts can still be exchanged according to pages 2 and 3 of this catalogue. Protection against acid and alkaline damage is provided by our A4 protective cover accessory. Protective covers extensively increase the life span of the contacts and minimise expensive repair work as well as down times. All contacts can also be supplied ready to be installed with complete base unit (power connection bar, insulation plate, etc.). It is also possible to produce individual customer specific versions for use in odd-sized or odd formed installation spaces by modifying the standard contact.

Contact Saddles Standard



Contact Saddle 2500 A



Contact Saddle with Base

Contact Saddle with Protective Cover

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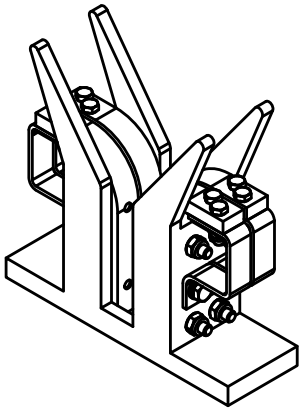
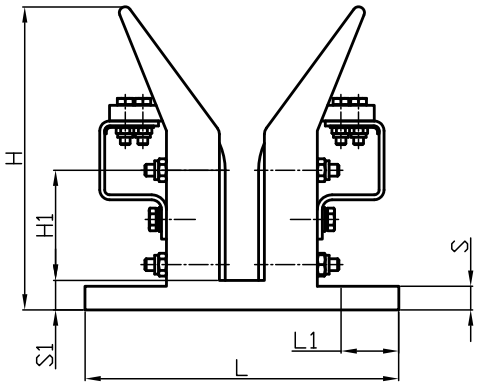
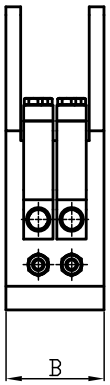
High Current Contact Saddles 250 – 4000 A
One Piece Model
with Integrated Guides







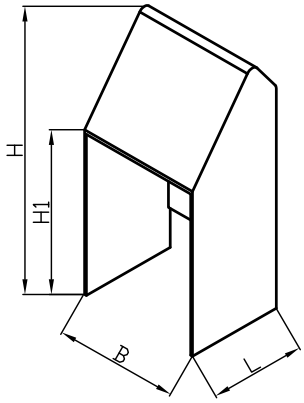
Part No. Contact block complete	Part No. Contact block with base	Part No. 1 set Replacement contact elements, Prefabricated	max. load	Suitable bus-bar height mm	Number of contact fingers	Dimensions mm L	L_1	B	H	H_1	S	S_1	Weight kg/piece without base
21005	**21105**	**21305**	250 A	40 - 60	2	160	35	50	150	60	12	15	3,10
21010	**21110**	**21310**	500 A	40 - 60	4	160	35	50	150	60	12	15	3,60
21015	**21115**	**21315**	500 A	80 - 120	4	160	35	50	180	85	12	15	4,20
21020	**21120**	**21320**	750 A	40 - 60	6	160	35	70	150	60	12	15	4,40
21025	**21125**	**21325**	750 A	80 - 120	6	160	35	70	180	85	12	15	5,00
21030	**21130**	**21330**	1000 A	40 - 60	6	160	35	70	150	60	12	15	4,50
21035	**21135**	**21335**	1000 A	80 - 120	6	160	35	70	180	85	12	15	5,10
21040	**21140**	**21340**	1500 A	40 - 60	6	160	35	70	150	60	12	15	4,60
21045	**21145**	**21345**	1500 A	80 - 120	6	160	35	70	180	85	12	15	5,20
21050	**21150**	**21350**	2000 A	80 - 120	8	160	35	85	180	85	12	15	7,10
21055	**21155**	**21355**	2500 A	80 - 120	10	190	45	100	180	85	15	20	9,40
21060	**21160**	**21360**	2500 A	80 - 120	10	210	45	140	180	85	15	20	11,70
21065	**21165**	**21365**	2500 A	100 - 160	10	210	45	140	205	105	15	20	13,20
21070	**21170**	**21370**	3000 A	80 - 120	12	210	45	140	180	85	15	20	12,70
21075	**21175**	**21375**	3000 A	100 - 160	12	210	45	140	205	105	15	20	13,80
21080	**21180**	**21380**	3500 A	80 - 120	12	210	45	140	180	85	15	20	14,10
21085	**21185**	**21385**	3500 A	100 - 160	12	210	45	140	205	105	15	20	15,40
21090	**21190**	**21390**	4000 A	80 - 120	14	210	45	140	180	85	15	20	14,70
21095	**21195**	**21395**	4000 A	100 - 160	14	210	45	140	205	105	15	20	16,20

Replacements

30690	Replacement spring – Stainless steel, Normal Version
30691	Replacement spring – Stainless steel, Heavy Version

Note: All contacts for a bus-bar thickness up to 20 mm are delivered as a one piece module. For heavier bars, the contacts can be delivered in two halves. **When ordering, please indicate the thickness and height of the bus-bars.** For lighter bus-bars (weight less than 50 kg), please contact us again, because the contacts must be set up accordingly.

Protective Covers - A4 Stainless Steel
Suitable for Contact Saddles 250 – 4000 A



Part No. Cover normal	Suitable for contact block Load	Part No.	Dimensions mm L	B	H	H_1
21205	250 - 500 A	21005/10	75	54	155	90
21215	500 A	21015	75	54	185	120
21220	750 - 1500 A	21020/30/40	75	74	155	90
21225	750 - 1500 A	21025/35/45	75	74	185	120
21250	2000 A	21050	75	89	190	120
21255	2500 A	21055	95	104	190	120
21260	2500 - 4000 A	21060/70/80/90	105	139	190	120
21265	2500 - 4000 A	21065/75/85/95	105	139	210	145

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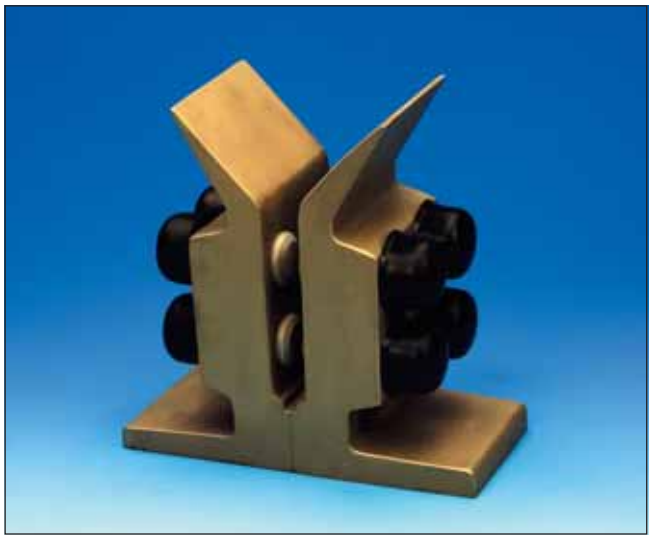
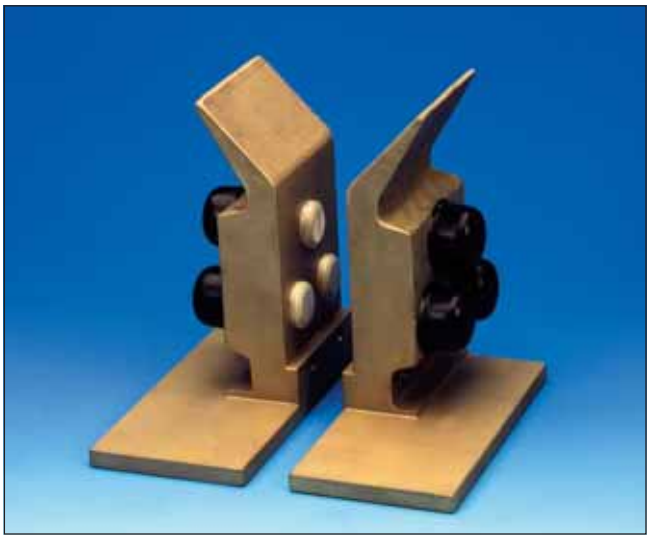
High Current Bolt Contacts 1000 - 12000 A
With Spring Fed Contact Bolts
druseidt System

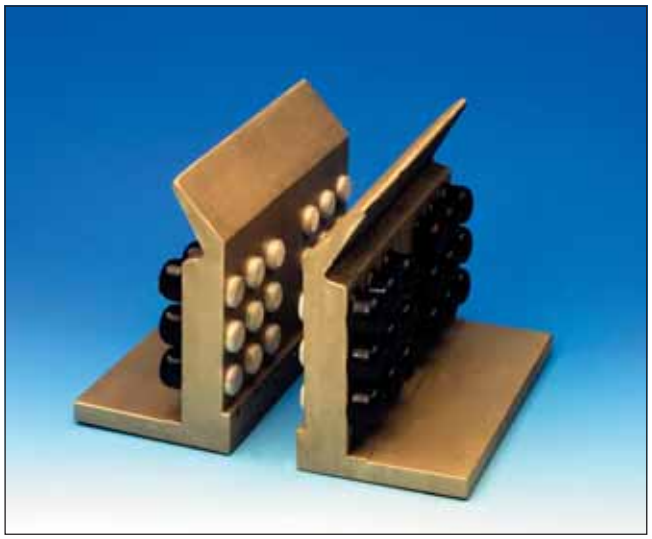
druseidt High Current Bolt Contacts consist of two equal contact halves that are fixed together. These are configured for the required bus-bar thickness before delivery. For bus-bar thickness over 10 mm, respective spacing elements are utilised. The current transfer is made over several points on the spring fed E-Cu contact bolts with a beryllium disk. The amount and layout of the contact bolts depends on the desired current load and the height of the bus-bar. Inserting the bus-bar is performed using the bar's own weight. To guarantee effectiveness, especially in a fully automated environment, the bus-bars should be thoroughly bevelled in the contact area. The contact bolts can be quickly and easily exchanged from outside the unit. The standard version is delivered with silver coated E-Cu bolts (Part No. 50215). To increase the current transfer, especially with longer tank sessions, and to avoid abrasion these bolts are also available furnished with a soldered silver plate (Part No. 55215). The high current bolt contacts in this system are made of MS-Cast is stable and immune to interference. Bolt contacts can be connected directly to the current supply bar with no problems. The smaller contacts (up to 5000 A) are therefore available with or without the connection tabs to which e.g. flexible braided cable can be attached. druseidt high current bolt contacts are a very good alternative for any type of simple massive cast contact applications.



Bolt Contact without connecting tab 3000 A



Bolt Contact with double connecting tab 2500 A



Bolt Contact 10000 A with 3 contact rows

Contact Bolts / Beryllium Disks

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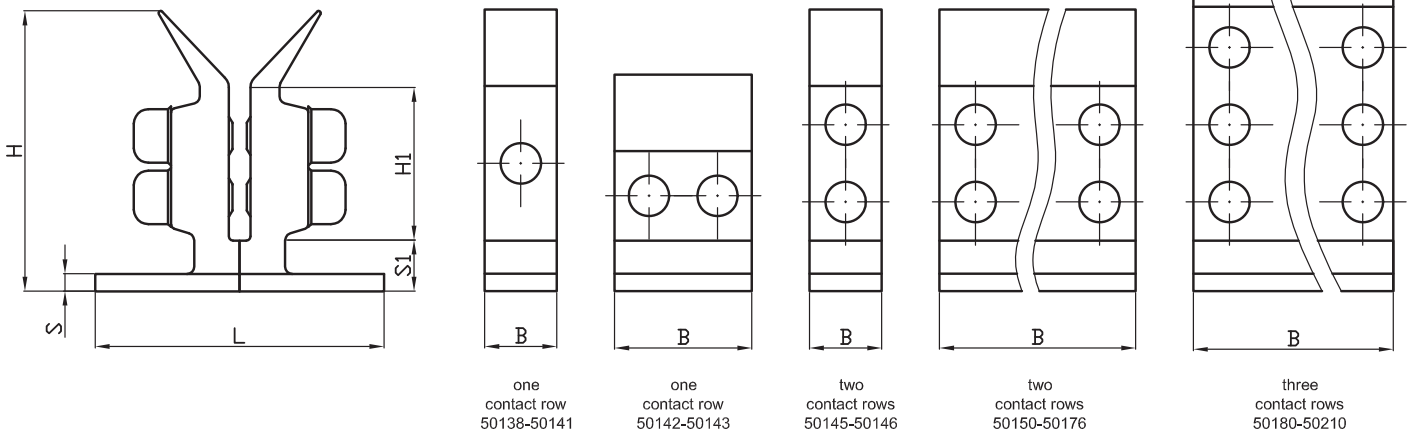
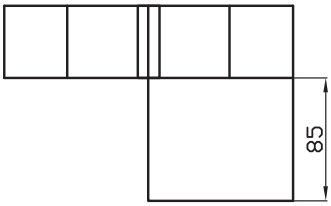
High Current Bolt Contact 1000 – 12000 A
With Spring Fed Contact Bolts
druseidt System

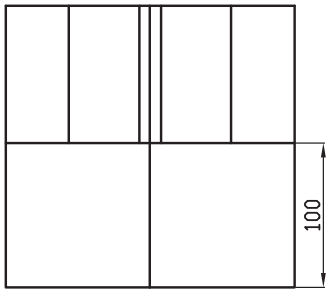


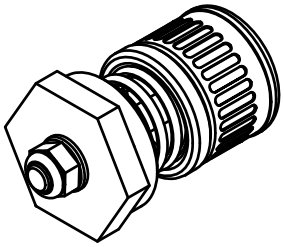
one contact row 50138-50141 | one contact row 50142-50143 | two contact rows 50145-50146 | two contact rows 50150-50176 | three contact rows 50180-50210

contact block with one connecting tab
Part.-No.
50139 50141



contact block with double connecting tab
Part.-No.
50143 50161
50146 50166
50151 50171
50156 50176





Contact Bolt

Part No. Contact block complete	Part No. Contact block with connecting tab	max. load	Suitable bus-bar height mm	Number of contact bolts	Number of contact rows	L	B	H	H_1	S	S_1	Weight kg/piece without connecting tab
50138	**50139**	1000 A	40 - 60	2	1	195	50	150	65	15	35	4,50
50140	**50141**	1000 A	80 - 120	2	1	195	50	195	110	15	35	5,50
50142	**50143**	1600 A	40 - 60	4	1	195	95	150	65	15	35	8,20
50145	**50146**	1600 A	90 - 140	4	2	195	50	195	110	15	35	5,60
50150	**50151**	2500 A	90 - 140	6	2	195	95	195	110	15	35	10,50
50155	**50156**	3000 A	90 - 140	8	2	195	95	195	110	15	35	10,90
50160	**50161**	3500 A	90 - 140	10	2	195	140	195	110	15	35	16,70
50165	**50166**	4000 A	90 - 140	12	2	195	140	195	110	15	35	16,70
50170	**50171**	4500 A	90 - 140	14	2	195	185	195	110	15	35	20,10
50175	**50176**	5000 A	90 - 140	16	2	195	185	195	110	15	35	20,10
50180	-	5000 A	130 - 200	20	3	315	185	250	155	20	40	35,50
50185	-	6000 A	130 - 200	24	3	315	185	250	155	20	40	35,60
50190	-	8000 A	130 - 200	26	3	315	230	250	155	20	40	44,10
50195	-	9000 A	130 - 200	30	3	315	230	250	155	20	40	44,20
50200	-	10000 A	130 - 200	36	3	315	320	250	155	20	40	63,10
50205	-	11000 A	130 - 200	40	3	315	320	250	155	20	40	63,20
50210	-	12000 A	130 - 200	42	3	315	320	250	155	20	40	63,20

Accessories/Replacements

50215	Ready to install replacement contact bolts, Normal version silver coated	0,17
55215	Ready to install replacement contact bolts, Special version furnished with a soldered silver plate	0,19
55216	Replacement springs – Stainless steel, Normal version	
55217	Replacement springs – Stainless steel, Heavy version	
55218	Replacement springs – Stainless steel, Heavy Duty version	

Note: The L dimension from the table above is to be used in combination with a 10 mm thick bus-bar. For bus-bars of greater thickness, either a one piece version with spacing elements or a two piece system without spacing elements are available. **When ordering please be sure to indicate the thickness and height of the bus-bar.**

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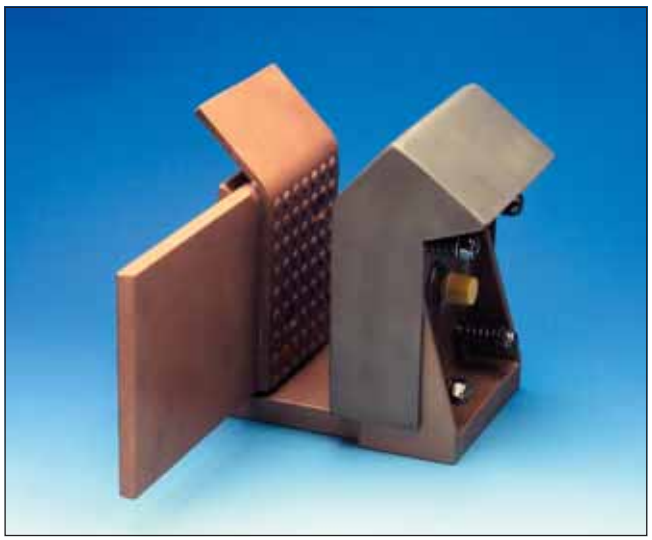
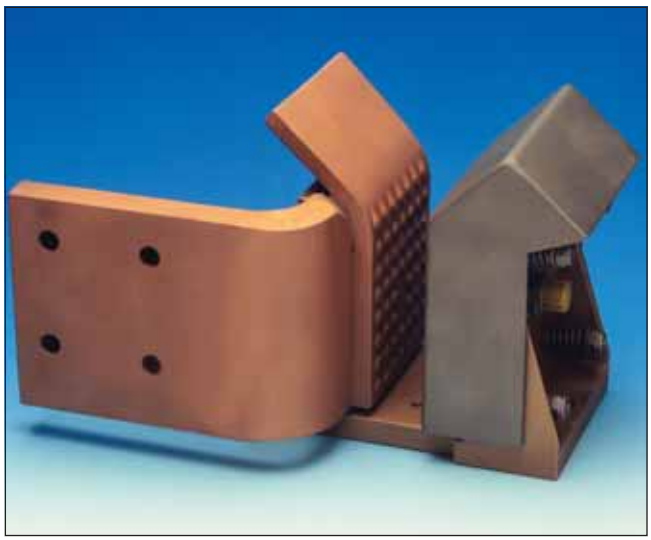
Pneumatically Activated High Current Contacts 1500 - 3000 A
druseidt System – Compact model 2500

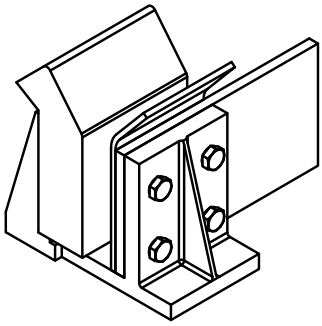
This extremely robust and durable system developed by druseidt provides a loss-free current transfer to the bus-bar. With the standard version, the contactor consists of a fixed contact plate with a inflexible connection to the contact rail and a pneumatically activated moveable contact plate which is held back with a spring and requires no connection to the contact rail. The stamped contact surfaces are formed for an optimum current transfer. The pneumatic drive runs with a so-called pneumatic cushion which is built into the contact and protected from hazardous or aggressive elements. This system does not require any large pressure cylinder which depends on the application in cases. The druseidt contact has a space-saving compact form and can be utilised in very small areas. The stable frame of red brass used in combination with stainless steel components makes a very strong and durable mechanical structure. The pneumatic cushion can be obtained as a replacement part and can be easily exchanged if ever required. The contacts in the standard version have a straight E-Cu connection plate which is approximately 150 mm long. Longer or angled connection plates are also available. Another standard version with an extra insulation plate which is screwed onto the unit for mounting on metal walls is also available. At least 4 to 5 bar air pressure is required for operation. Air requirements are extremely low at approximately 0.2 litres per switching procedure. The contacts can be operated with pneumatic hand switches or can be integrated in the existing pneumatic control. Since the bus-bar has no spring resistance during insertion, these contacts are also very suitable for contacting extremely light bars.

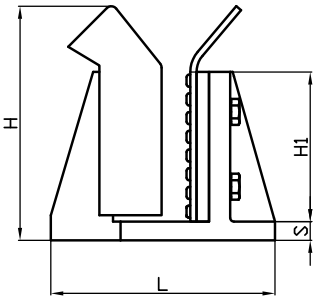


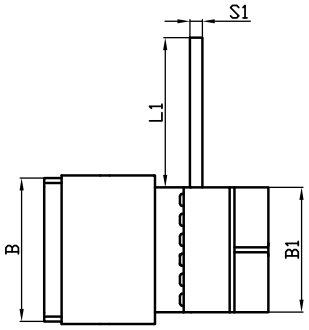
Standard Version



Special Version with 90° angled connection plate







Part No. Contact block complete	**Part No.** Contact block with additional insulation plate	max. load	Suitable bus-bar height mm	Dimensions mm L	L_1	B	B_1	H	H_1	S	S_1	Weight kg/piece
25100	**25110**	1500 A	80 - 150	180	150	120	100	180	100	15	10	13,20
25200	**25210**	2000 A	80 - 150	180	150	120	100	180	120	15	10	13,60
25300	**25310**	2500 A	80 - 150	180	150	120	100	180	120	15	15	14,10
25400	**25410**	3000 A	80 - 150	180	150	120	100	180	120	15	20	14,60
Replacements												
31111	Replacement pneumatic cushion											0,20

Note: The L measurement in the table is only to be used with bus-bars up to 20 mm thick. The contacts are set match the existing bars before they are delivered. **Therefore please indicate the bus-bar thickness and height when ordering the contacts.** Standard contacts are delivered with a straight contact plate of 150 mm. If desired, longer contact plates or 90° angled plates are also available.

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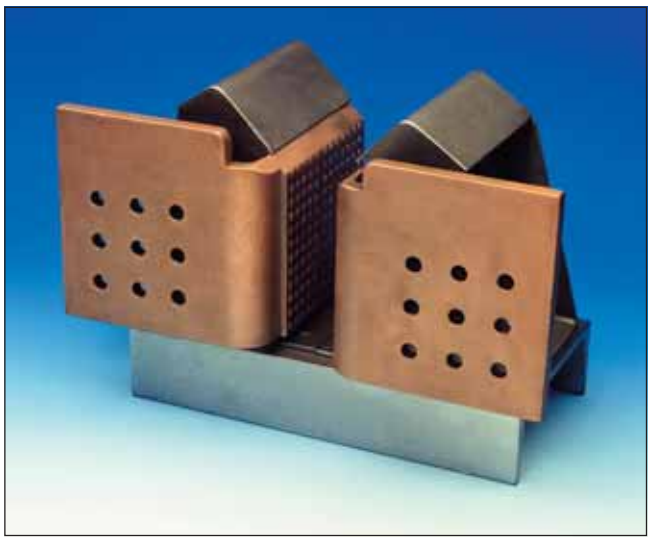
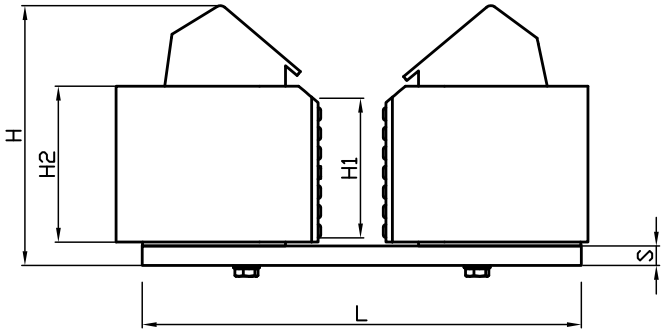
Pneumatically Activated High Current Contacts 4000 - 12000 A
druseidt System – Compact model 3000

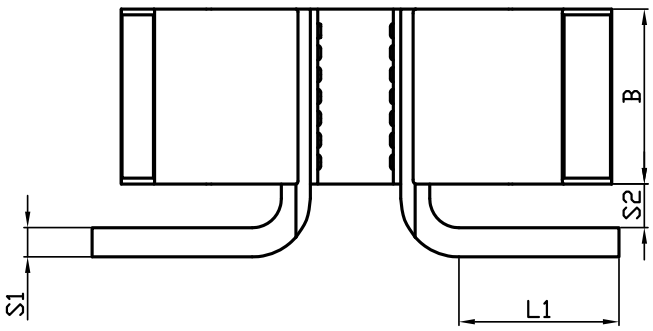
Pneumatically activated high current contacts of the druseidt „Compact model 3000“ range are utilised with high current levels and heavy bus-bars (e.g. in anodising and hard chrome systems) because of their high pressure contact and the extra stable construction. The basic construction as well as the protective covers are built of stable rust-free and acid-resistant stainless steel. Current is transferred on both sides through specially stamped E-Cu contact plates. The pneumatic drive use a pneumatic cushion built into the contact on one side where it is protected. If desired and for an extra charge, this system can be equipped with pneumatic drives on both sides of the unit. Connecting the contacts to the current supply is done with the E-Cu contact plates on both sides. The moveable contact block side must be connected with flexible cables (braided). The fixed side of the contact can be connected with massive bars. Standard E-Cu connection plates are angled at approx. 90°. Longer or straight connection plates can be ordered if they are desired. All standard contacts are either provided without or ready to install with a 15 mm insulation plate screwed into place. To install the unit on a wall edge, only four drill holes are required. The air pressure required to operate the unit should be 4 to 6 bar. Operation is possible with manual switches as well as with a pneumatic control unit.



Pneumatic Contact with Drilled Connection Plates

Replacement Pneumatic Cushions





Part No. Contact block complete	Part No. Contact block with extra insulation plate	max. load	Suitable bus-bar height mm	Dimensions mm L	L_1	B	H	H_1	H_2	S	S_1	S_2	Weight kg/piece
31109	**31110**	4000 A	80-140	305	135	120	200	110	120	15	15	50	21,20
31219	**31220**	6000 A	80-140	315	140	120	200	105	120	15	20	50	26,10
31329	**31330**	6000 A	120-200	335	175	170	250	150	160	15	15	50	26,90
31659	**31660**	8000 A	140-250	350	220	215	295	185	200	15	20	50	38,50
31769	**31770**	10000 A	160-250	360	220	215	300	185	200	20	20	50	49,60
31879	**31880**	12000 A	160-250	370	220	215	300	180	200	20	25	50	54,10

Replacements		
31111	Replacement pneumatic cushion for contacts 31109/10 and 31219/20	0,20
33333	Replacement pneumatic cushion for contacts 31329/30	0,30
37777	Replacement pneumatic cushion for contacts 31659/60, 31769/70 and 31879/80	0,53

Note: The L dimension in the table refers to bus-bars which are 20 mm thick and this value changes accordingly with the thickness of the bar. The contacts are set up for the existing bus-bar before they are shipped. **Therefore please indicate the bus-bar thickness and height when ordering.**

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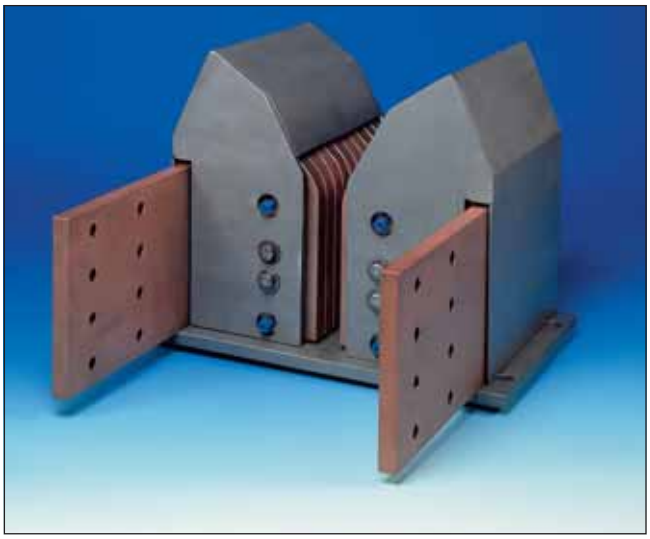
Pneumatically Activated High Current Contacts 4000 - 20000 A
With Moveable Spring Loaded Pneumatically Activated Contact Fingers druseidt System

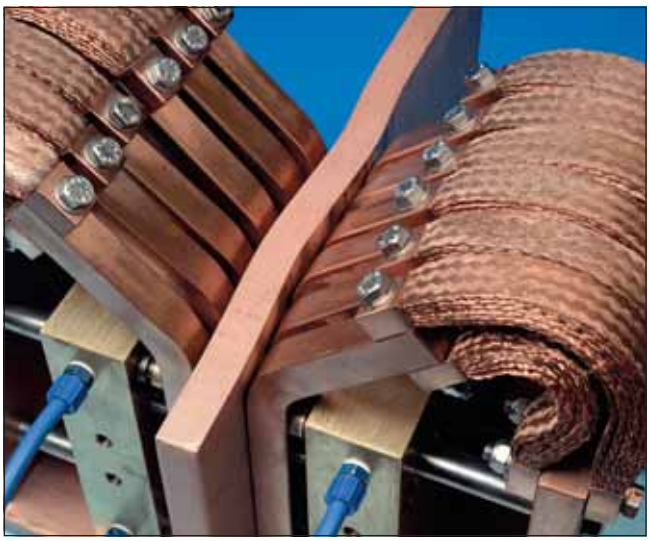
This is a new druseidt product range which came about because of application problems. Since pneumatically activated contacts are mainly used with high current levels and heavier bus-bars, problems quite often occur in the quality of the current transfer especially with older systems or systems that run full time. The existing bus-bars are either damaged or bent in the area of contact after a certain amount of use. With the standard contact ranges this would cause the contact surfaces of the bus-bars to lie on just a portion of the contact area of the contact which leads to overheating in areas and contact problems. In order to solve these problems, especially on systems that run full time to reduce down times and system repairs, we have developed this new pneumatic contact range. Our new contact system, with its moveable contact fingers, adapts to the contact area even if the bar is bent or twisted up to 10 mm. All contacts have been equipped with a simple druseidt designed pneumatic construction. No complicated pneumatic cylinders or pneumatic cushions are required. The bus-bar slides in using its own momentum. This procedure causes a self-cleaning effect on the bar as it slides through the guides. The contacts require a minimum of maintenance and are very robust under heavy mechanical loads. The contact units are covered to the largest possible extent with extra stable stainless steel covers. The contact system is built modularly and can be adapted to the height as well as the width of systems having little extra space. The connection to the current supply system can either be made using the base plate or a connection side plate with massive copper. This contact system has proven itself in the transferral of high current loads. Systems with up to 40,000 A have been equipped with this contact system.

Contact installed on a E-Cu Base Plate



Contact with Straight E-Cu Side Plates

Contact for Double Bars



Pneumatically Activated Moveable Contact Fingers

The measurements of these contacts are adapted using standard system modules to suit the individual application requirements. If you are interested in this contact system please consult druseidt for specifications.

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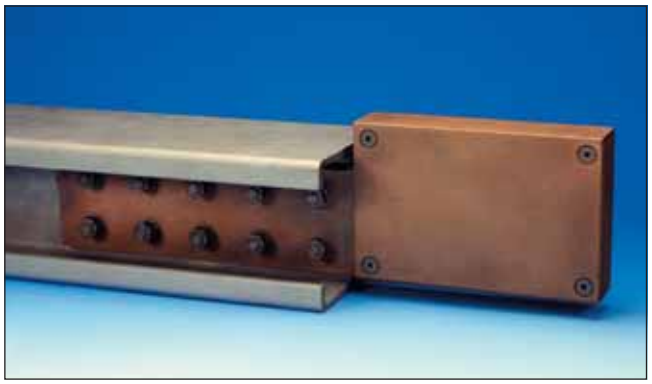
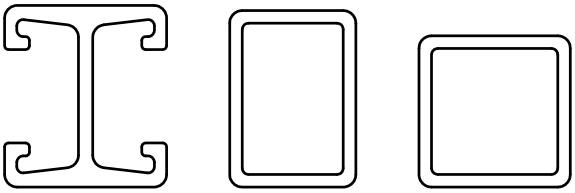
Aluminium Work Rods
Contact Flange of E-Cu for Aluminium Bars

For anodising systems and similar applications, in addition to our high current contact systems we can provide complete bus-bar units made of aluminium or aluminium alloy upon request. The form and variation can be adapted to suit your individual mechanical and electrical application requirements. We would be glad to provide consultation for your application.
The surface of Aluminium oxidises in the air. The layer of oxidised aluminium creates an additional resistance in the area of contact and allows less current to pass through the contact. Contacts are normally made of copper, even in anodising systems. When utilising aluminium bars, copper and aluminium must contact for the connection. According to electrochemical voltage table however, metals that do not have the same conductance capacities will generate a certain amount of corrosion when joined together with other influences such as water or acid. The damage will be respectively greater with the difference in voltage. With aluminium in eighth place in the voltage table and copper in the 23rd position, danger of corrosion is fairly high. We recommend therefore to equip the contact areas on aluminium bus-bars with E-Cu contact plates. We produce contact plates of many different shapes and sizes and also for integrating into existing bars. The contact plates can integrated into the aluminium bars with a bimetallic plate and using the respective contact grease to guarantee good contact and to stop corrosion.

Installation Example for Contact Plates



Example of Aluminium Bar Profile Forms

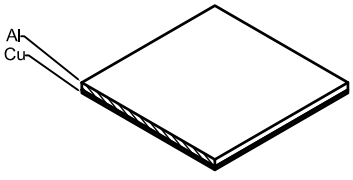


The images above show a few application variations. For consultation on your specific requirements please send us your application layout indicating your needs and we will be glad to provide you with the information that you require.

Bimetallic Elements

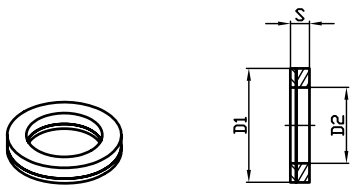
Bimetallic elements consist of copper plated aluminium plates. Since the connection area of both metals is in the middle, it is kept away from air and humidity. This material enables a secure contact and a corrosion protected connection between copper and aluminium. Besides bimetallic plates and spacers, we can also supply cut-outs with and without drill holes especially for your specific application.

Bimetallic Sheets



Part No.	Dimensions mm Length	Width	Thickness	Weight kg/plate
02670	2000	600	1	5,60
02671	2000	600	1,5	8,40
02672	2000	600	2	11,20
02673	2000	600	3	16,80

Bimetallic Washers



Part No.	Dimensions mm d_1	d_2	s	For bolts	Weight kg/% piece
13295	8	3,5	1	M 3	0,02
13296	10	4,5	1	M 4	0,03
13297	12	5,5	1	M 5	0,05
02675	15	6,5	1	M 6	0,07
02676	18	8,5	1	M 8	0,09
02677	22	10,5	1,5	M10	0,18
02678	25	13	2	M12	0,68
02679	28	13	2	M12	0,44
02680	35	17	2	M16	0,66

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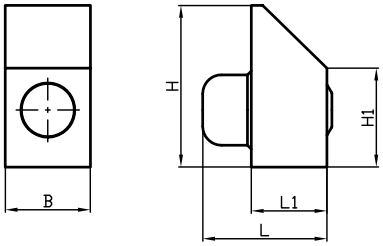
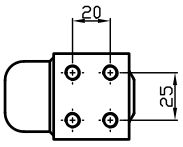
Bolt Contact Modules 400 - 1250 A with Spring-Fed Contact Bolts

The contact principle of this module is based on our assembled bolt contacts shown on pages 3/10 and 3/11 of this catalogue. Contact modules are suitable for transferring low current in narrow spaces or for use in equipments with manual operations. They are therefore quite often used as anode contacts as well. By combining a few of these modules, more current can be carried. The current transfer is done through the spring loaded contact bolts by means of a beryllium disk. The contact bolts can be exchanged from the outside. If desired, the modules can be assembled and mounted on Cu or MS bars for delivery.

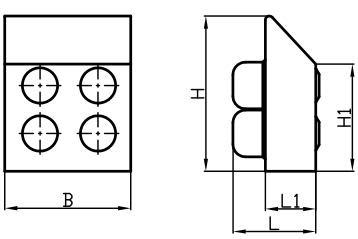
Bolt Contact Modules 1/2 Fold

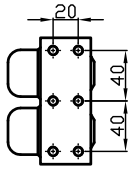
Bolt Contact Modules 3/4 Fold





Drilling Layout



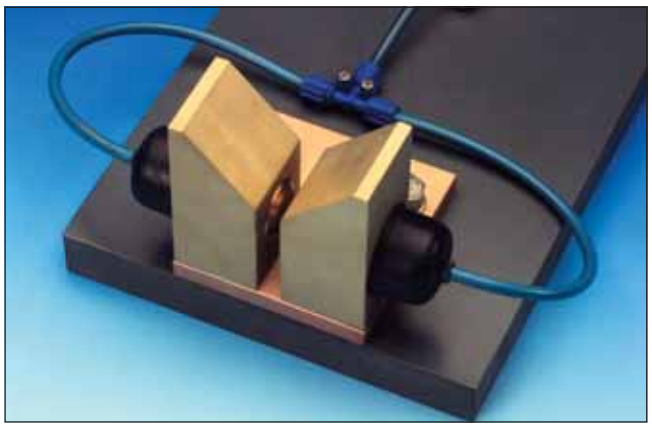


Drilling Layout

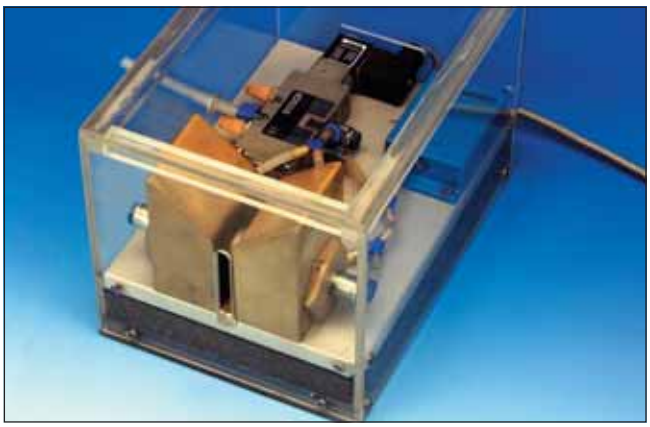
Part No.	Version	max. load	Dimensions mm L	L_1	B	H	H_1	Drill Holes	Weight kg/Piece
17065	1 contact bolt	400 A	65	40	45	85	50	M8	1,20
17040	2 contact bolts	750 A	65	40	45	123	90	M8	1,70
17041	3 contact bolts	1000 A	65	40	100	123	90	M8	3,60
17042	4 contact bolts	1250 A	65	40	100	123	90	M8	3,70
Replacements									
50215	Installation ready replacement contact bolts, Silver plated								0,17
55216	Replacement springs – Stainless steel, Normal Version								
55217	Replacement springs – Stainless steel, Heavy Version								

Pneumatically Activated Bolt Contact Modules

For special applications, pneumatically activated bolt modules are also available. These contacts can be used everywhere that contact cannot be made directly because of low current- or bus-bar weights. Pneumatically activated bolt modules are relatively small and can also be used as switching elements. These are only produced after suitability testing for the application. The dimensions of this type are NOT the same as in the table above.



Pneumatically Activated Bolt Modules



Test Unit for Determining Switching Rate

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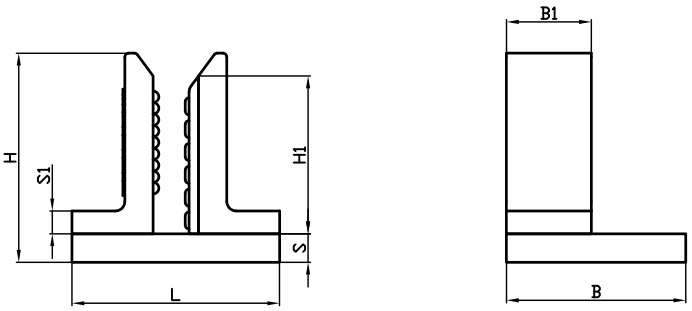
Contacts 500-2500 A
for Current / Anode Bar contacting

Robust contact system. Especially suited for contacting current bars or anode connections which are not permanently moved in or out. The contact surface is stamped with a special pattern for improved current transfer. The contact pressure is created with spring fed, exchangeable stainless steel ball bearings. The contacts are mounted on an E-Cu plate and set up for the existing current or anode bar before being shipped. **Therefore please indicate the thickness of the anode or current bar when ordering.**



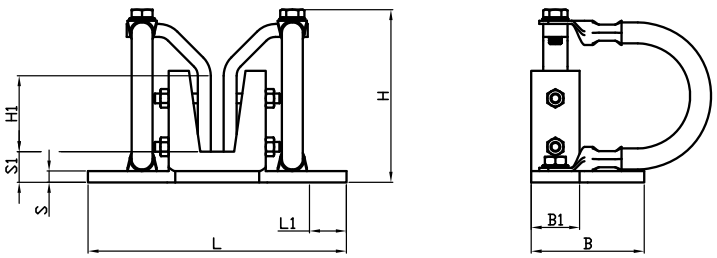
Part No.	Max. load	Suitable bus-bar height mm	Dimensions mm L	B	B_1	H	H_1	S	S_1	Weight kg/piece
17047	500 A	50 - 100	105	90	40	100	80	10	12	3,00
17049	1000 A	50 - 100	105	110	60	100	80	10	12	4,50
17051	1500 A	80 - 120	105	140	80	100	80	15	12	6,00
17053	2000 A	80 - 120	105	180	100	100	80	20	12	7,50
17055	2500 A	80 - 120	105	220	120	100	80	20	12	9,00

Replacements:
17057 Spring fed stainless steel ball bearings including screws

Note: The L dimension in the table refers only to current or anode bars of 10 mm thickness. This value increases with increasing bar thickness.

Contact Saddles 250-500 A

Contact system for smaller equipments, e.g. in research laboratory applications. The current transfer is made through spring fed contact fingers which are connected to the base unit with insulated flexible current cables. The contact surfaces are cleaned as much as possible during the bar insertion. The contacts are configured only for a bus-bar thickness of 10 mm.



Part No.	max. load	Suitable bus-bar height mm	Number of contact fingers	L	L_1	B	B_1	H	H_1	S	S_1	Weight kg/piece
50230	250 A	50-80	2	160	25	70	30	110	45	7	20	1,0
50232	500 A	50-80	4	160	40	75	45	110	50	12	20	2,2

Replacements
30690 Replacement springs – Stainless steel
50234 Replacement insulated cable

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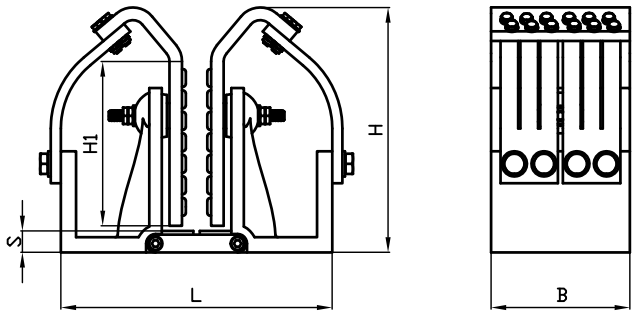
Contact Saddles with Spring and Stamped Contact Plates 1500 - 3000 A
druseidt System

These are special contacts developed by druseidt. The current transfer is made through spring loaded contact saddles with stamped contact plates which are connected with the base unit via E-Cu foils. The contact halves are held together with stainless steel bands which are adjusted to the bus-bar thickness before delivery. We recommend using the stainless steel protective covers provided as accessories.

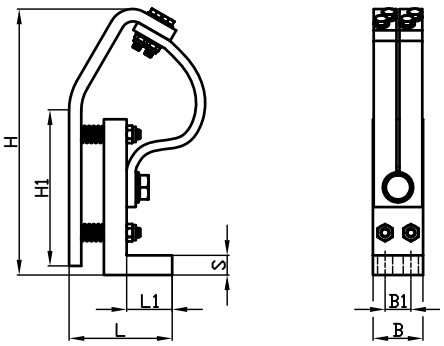


Part No. Contact block complete	**Part No.** Contact block with base	**Part No.** 1 pair protective covers - A4 stainless steel	**Part No.** 1 set replacement contact elements prefabricated	max. load	Suitable bus-bar height mm	Dimensions mm L	B	H	H_1	S	Weight kg/piece without base
50001	**50051**	**17061**	**17070**	1500 A	60 - 120	210	60	160	90	17	5,00
50011	**50061**	**17063**	**17075**	3000 A	60 - 120	240	110	160	90	17	11,00
50016	**50066**	**17064**	**17077**	3000 A	120 - 200	210	110	210	125	17	13,50

Note: The L measurement in the table refers to bus-bars with a thickness of 10 mm. This value increases respectively when using thicker bars.

Contact Saddle Modules 400-600 A

These utilise is the same contact method as high current contact saddles (Pages 3 and 4 in this catalogue). Suitable for use in tight spaces. By combining or mounting these modules side by side this system can also be used in applications with higher current loads. Installation information can be obtained upon request.



Part No.	Version	max. load	Suitable bus-bar height	L	L_1	B	B_1	H	H_1	S	Drill holes Ø	Weight kg/piece
17000	2 fold module	400 A	60 - 120	65	30	33	15	180	90	12	9	1,30
17001	3 fold module	600 A	60 - 120	65	30	50	30	180	90	12	9	1,90

Replacements

30690	Replacement springs – Stainless steel
17198	Replacement foils – 2 fold
17199	Replacement foils – 3 fold

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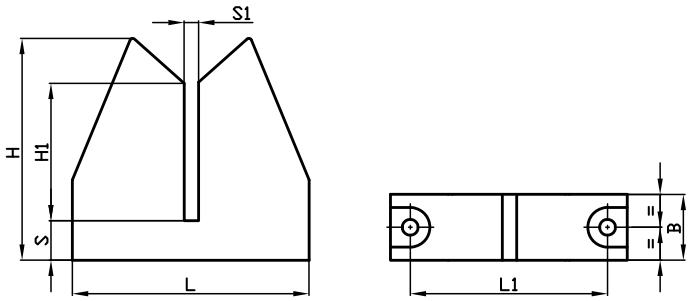
Prism Support Blocks
Material: Plastic RCH 500

druseidt prism support blocks are used as holding bus-bars for all non-conducting tanks, loading and unloading stations. The standard support blocks are made out of RCH 500 material. If desired, all versions are also available in different materials or dimensions.

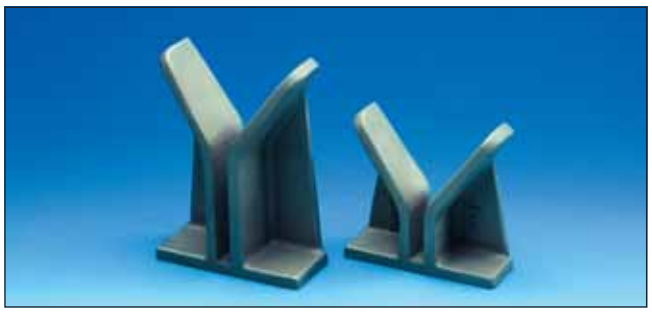


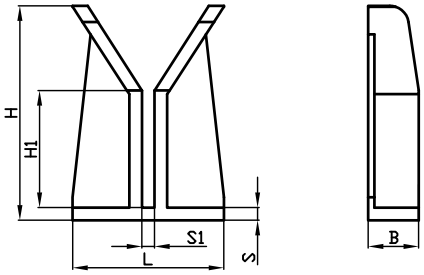
Part No.	Max. bus-bar height	Dimensions mm L	L_1	B	H	H_1	S	S_1	Drill holes Ø	Weight kg/piece
51135	60	180	150	40	130	60	30	Specify	12	0,45
51136	120	180	150	50	170	100	30		12	0,80
51137	160	220	190	60	210	140	40		12	0,95
51138	200	220	190	60	250	180	40		12	2,45

Note: The S_1 measurements change depending on the thickness of the bus-bar. **Please indicate the thickness of the bus-bar in your order.**

Prism Support Blocks, Material: Brass-Casting

Prism support blocks made of metal. Especially suitable for holding heavier bus-bars.



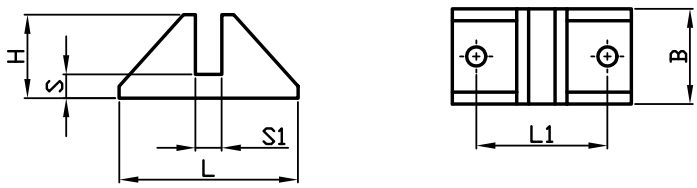


Part No.	Max. bus-bar height	Dimensions mm L	B	H	H_1	S	S_1	Weight kg/piece
51040	60	120	40	110	40	10	12	1,50
51050	120	120	50	160	85	10	12	2,00
51065*	200	100	65	200	130	15	-	5,70

**Note: ***Part No. 51065 consists of 2 halves not connected to one-another.

Anode Bar Supports, Material: Plastic

Small plastic support/bar supports. Especially suited to supporting anode bars in galvanic tanks.



Part No.	For bus-bars	Dimensions mm L	L_1	B	H	S	S_1	Drill holes Ø	Weight kg/piece
54100	50 x 5	75	55	40	35	10	6	8,5	0,05
54105	50 x 10	75	55	40	35	10	11	8,5	0,04
54106	100 x 10	100	70	40	67	10	11	8,5	0,10
54110	no groove	75	55	40	35	10	–	8,5	0,12

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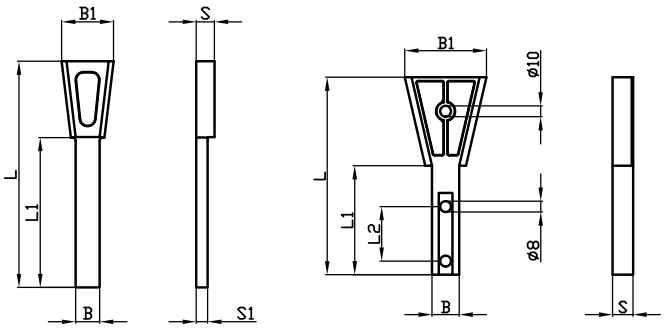
Contacts for Plating Racks

Rack Contacts

Rack contacts in swallow-tail format for screw / solder connection. These contacts used in combination with our free sliding contact holders (Part No: 31901 and 31902) or with the universally applicable Cu-holder (Part No.: 51540) provide the rack with a good and inexpensive method of contact for plating racks.

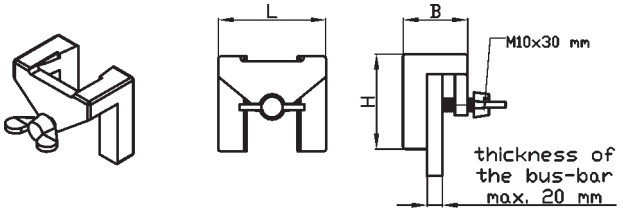


Part No. 51520 Part No. 51521/51537

Part No.	load	Dimensions mm L	L_1	L_2	B	B_1	S	S_1	Weight kg/piece
51520	500 A	200	130	-	21	45	10	16	0,45
51521	500 A	135	70	35	19	45	15	-	0,35
51537	1200 A	135	70	35	30	65	15	-	0,50

Contact Holders

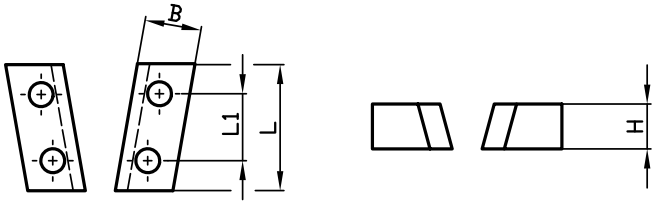
Direct contact holders are used for holding our rack contacts (Part No.: 51520/21 and 51537) or products having the same measurements. These can be set for bus-bars from 5 to 20 mm thick. The contact holders can be moved freely on the bus-bar and can be tightened into a fixed position with the secure butterfly screw made of brass. druseidt direct contact holders are made of a high grade cast alloy which dependably prevents bending when extra heavy racks come into play.



Part No.	Suitable for rack contact	Dimensions mm L	B	H	Weight kg/piece
31901	51537	114	51	70	1,10
31902	51520/21	85	51	70	0,85

Cu-Holders for Rack Contacts

druseidt-Cu-holders are suitable for 500 A rack contacts (Part No. 51520/51521) as well as 1200 A (Part No. 51537). They are screwed into place on the bus-bar.



Part No.	Dimensions mm L	L_1	B	H	Drill Holes Ø	Weight kg/Pair
51540	50	25	19	15	8,5	0,21

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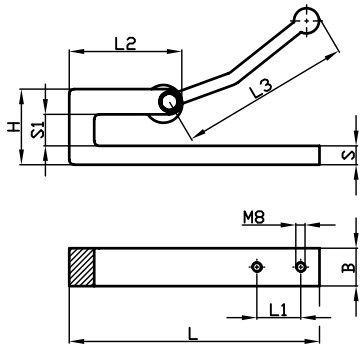
Cam Levered – Rack Contacts

Free sliding rack contacts, suitable as contact elements for plating racks as well as for use as clamp contacts at the end of a cable. These are clamped into place using the cam lever. The rack contact is configured for the proper bus-bar thickness before delivery. **Therefore please indicate the bus-bar thickness in your order.**



Part No.	max. load	Suitable for bus-bar thickness	Dimensions mm L	L_1	L_2	L_3	B	H	S	S_1	Weight kg/piece
51635	500 A	10/15	135	30	58	125	26	44	10	19	0,70
51640	800 A	10/15	200	35	90	145	30	50	11	18	1,20
51641	1000 A	20	200	35	90	145	30	59	14	24	1,50

Wing Nuts

Wing nuts are available in various materials and wing/plate diameters. These are suitable for use as clamping elements for plating racks or anodes.

Part No.	Thread	Wing-Ø	Plate-Ø	Material	Weight kg/%piece
17780	M 8	40	40	Stainl. Steel A4	3,90
17785	M10	50	40	Stainl. Steel A4	6,50
17790	M12	65	50	Stainl. Steel A4	11,50
53500	M 8	40	35	Brass	5,00
53505	M10	40	35	Brass	5,10
53510	M 8	95	45	Red Bronze	24,00
53515	M10	95	45	Red Bronze	23,80
17795	M12	95	45	Red Bronze	23,60
17800	M 8	95	45	Aluminium	7,00
17805	M10	95	45	Aluminium	6,90
17810	M12	95	45	Aluminium	6,80

Butterfly Bolts

Robust clamping elements for plating racks or anodes with various diameters and materials.

Part No.	Thread	Wing-Ø	Plate-Ø	Material	Weight kg/%piece
17815	M 8 x 35	40	40	Stainl. Steel A4	8,00
17820	M10 x 35	50	40	Stainl. Steel A4	10,80
17825	M12 x 35	65	40	Stainl. Steel A4	15,50
53485	M10 x 25	45	40	Brass	10,00

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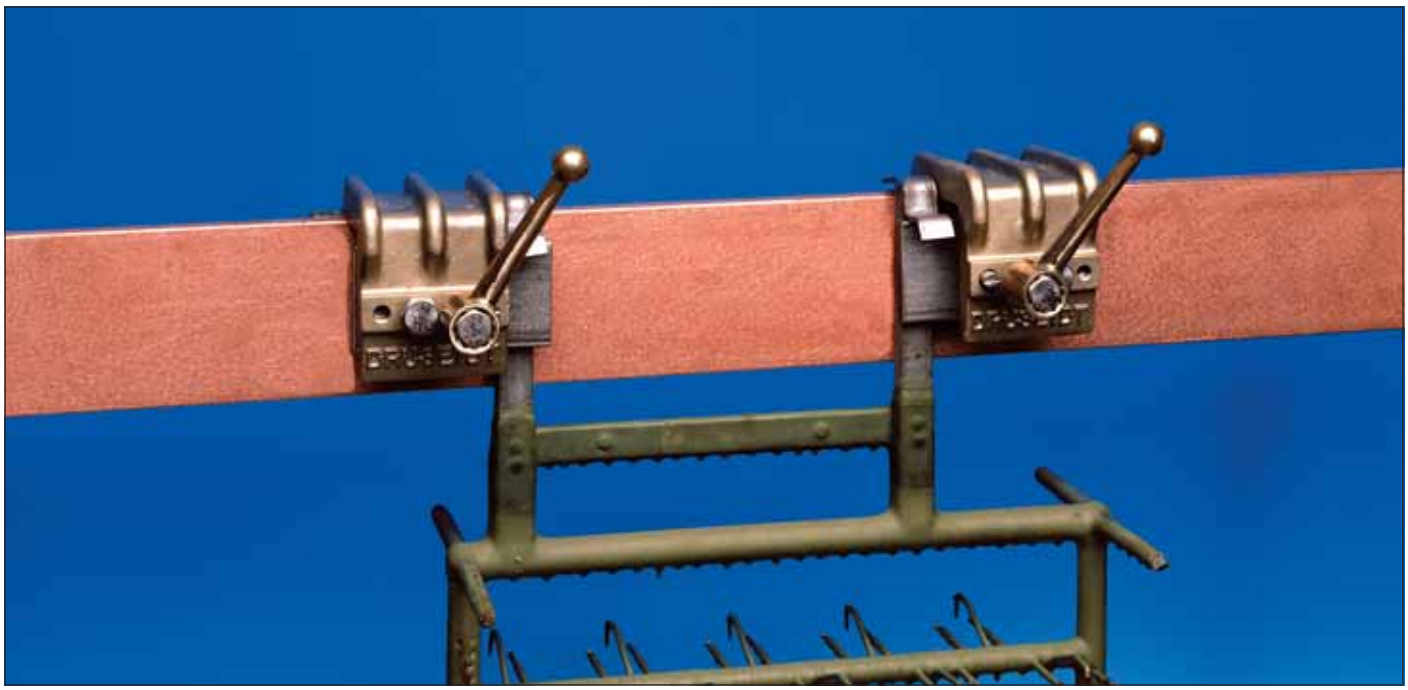
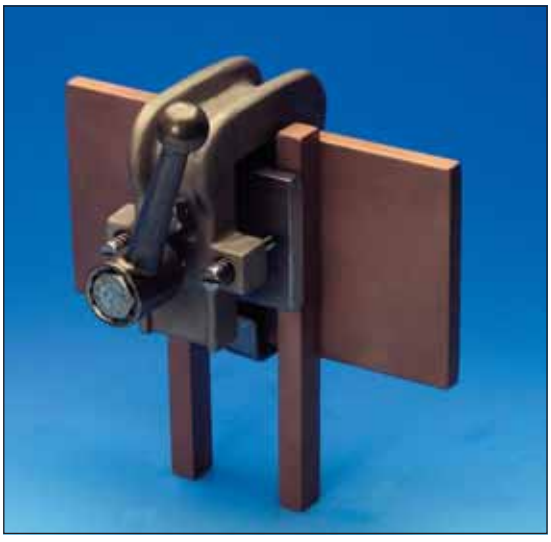
druseidt-Quick Mounting System for Plating Racks and Anodes

druseidt quick mounting system for plating racks enable an extremely quick and secure contact clamping for plating racks and anodes. Simply pressing down on the lever (approx. ¼ - ½ turn) clamps the rack tightly into place. The torque from the lever presses the stainless steel pressure plate on the rack or bus-bar. The high pressure exerted by the clamping action prevents and movement during application and guarantees a optimal current transferral. When using this druseidt contact system, the contact area never has to be checked. A fast and secure contact is made every time, whether the area is square pipe, flat iron, round or a sextant. Racks with contact heads already mounted can also be clamped just as easy. Compared to the cost of a standard system (working of the plating rack + contact head for each piece of rack + contact holder/clamping mechanism + necessary bus-bar working) this contact system offers an inexpensive alternative, especially for operation with many racks.

The quick fastening mechanism is placed over the bus-bar from the top and can be moved freely to the desired position. Fixing the rack clamp to the bar is done by means of a stainless steel clamp. An additional raised safety clip made of stainless steel prevents the contact head from falling in the tank when mounting or removing bars. Druseidt quick mounting system are made of a special acid resistant alloy. The mechanical properties of the unit have been chosen because of their use under high strengths. All springs, screws, pressure plates and fixing materials are made of stainless steel. The spring fed tightening lever is also made of an acid resistant special alloy and can be reset to any position at any time so that it doesn't get in the way during the coating procedure or when transporting the rack. Our quick fix mounting system are configured for the dimensions of the bus-bar as well as for the rack width and strength in the contact area before delivery. There are various sizes with different clamp opening widths so that the system is suitable for almost any racks or bars. Generally these clamps are available in a version that can either be tightened by pushing the lever to the left, the right or on both sides. For smaller racks we have developed a smaller version that can be levered straight out in the middle. **Please indicate the version and order number as well as the mounting rack width and strength in the contact area when ordering.**





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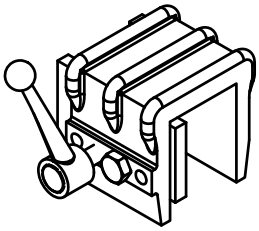
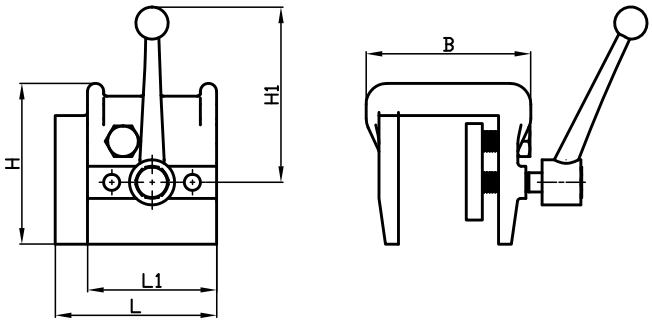
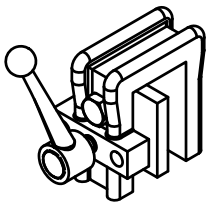
Rack Clamps
for Clamping Plating Racks and Anodes

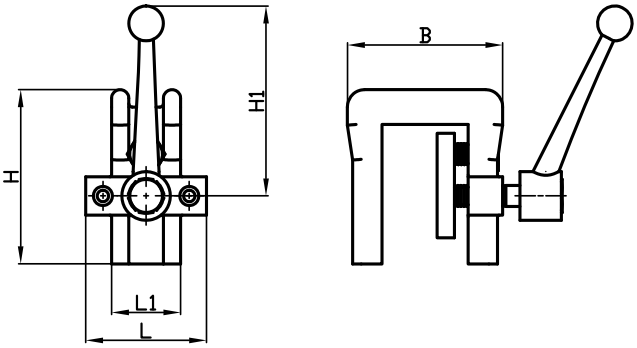


Type 1 - 5





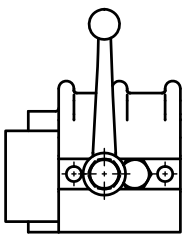
Type 7



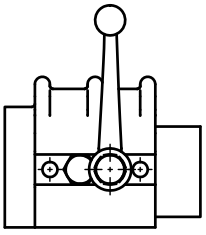
Part No.	Version	Max. clamp width	Dimensions mm L	L_1	B	H	H_1	Weight kg/piece
31950	Type 1 Tighten to Left	30	100	80	85	105	115	2,80
31951	Type 1 Tighten to Right							2,80
31952	Type 1 Both Sides							2,90
31955	Type 2 Tighten to Left	50	100	80	105	105	115	3,10
31956	Type 2 Tighten to Right							3,10
31957	Type 2 Both Sides							3,20
31960	Type 3 Tighten to Left	70	100	80	125	105	115	3,40
31961	Type 3 Tighten to Right							3,40
31962	Type 3 Both Sides							3,50
31965	Type 4 Tighten to Left	90	100	80	145	105	115	3,70
31966	Type 4 Tighten to Right							3,70
31967	Type 4 Both Sides							3,80
31970	Type 5 Tighten to Left	120	100	80	175	105	115	4,10
31971	Type 5 Tighten to Right							4,10
31972	Type 5 Both Sides							4,20
Small Version– for narrow installations								
31980	Type 7 Tighten to Left	35	70	40	95	105	115	1,80
31981	Type 7 Tighten to Right							1,80
31982	Type 7 Both Sides							1,90
31983	Type 7 Centred							1,70

Note: The opening width of the jaws on the clamp is determined by adding the bus-bar thickness and the rack thickness. The rack clamp is also equipped with a stainless steel raised safety clip which is made according to the height of the bus-bar. The width of the stainless steel clamping plate to the right/left is made according to the rack width and is normally approx. 25 mm. **Please indicate the bus-bar thickness and height as well as the thickness of the rack or diameter respectively when ordering the clamps.**

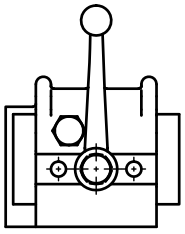
Clamping Methods



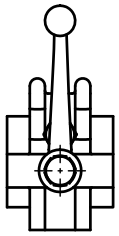
Tighten to Left



Tighten to Right



Both Sides



Centred

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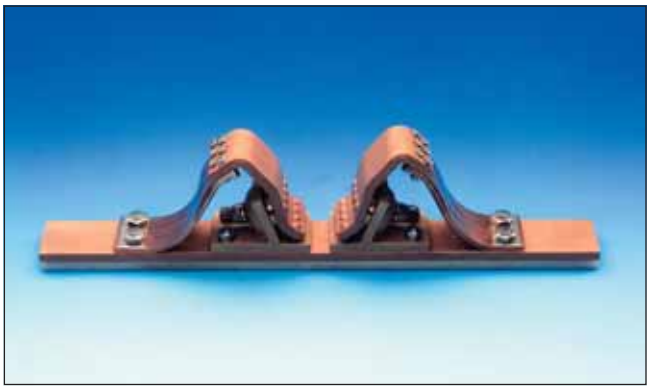
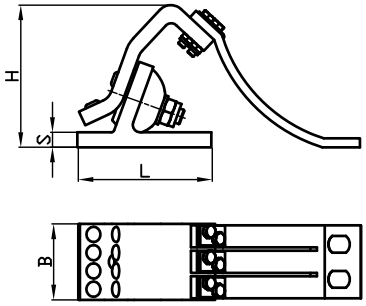
Spring Loaded – Contact Saddles for Round Bolts up to 1500 A

Contact saddles with moveable spring loaded contact surfaces that are stamped with a special profile for better contact. The contact surfaces and foils are made of E-Cu and the actual frame of the contact is made of red bronze. These are especially suitable for use with round contacts having a diameter of 40 to 70 mm. The contact is delivered in two halves. If requested, we can assemble the unit configured to the round contact and fixed on an E-Cu plate with or without insulating plate.

Part No. 51295 2 Piece Standard Version



Special Version: Contact Unit Mounted on E-Cu Plate



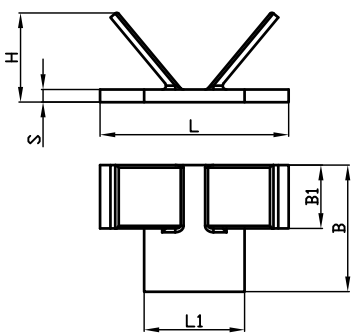
Part No.	Max. load	L	B	H	S	Weight kg/pair
		Dimensions mm				
51295	1500 A	90	50	100	10	2,40

Support Saddles for Round Bolts

Stable current conducting contacts made of red bronze, optionally with or without connection tab. Part No. 51161 = non-conductible unit made of RCH 500 material. All contacts are suitable for round bolts 20 – 60 mm diameter.

Part No. 51150 / 51155

Part No. 51161



Part No.	max. load	L	L_1	B	B_1	H	S	Weight kg/piece
		Dimensions mm						
51150	300 A	160	60	105	50	75	8	2,00
51155	300 A	160	-	-	50	75	8	1,70
51161	-	160	-	-	50	75	8	1,10

Note: Part No. 51161 double sided with standard 12 x 24 mm hole, Part No. 51150/55 without drilling.

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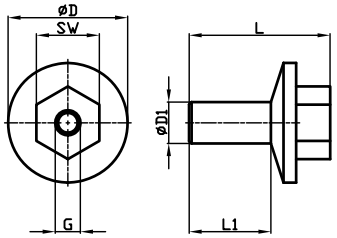
Round Contacts
for Barrel Units

Massive brass contacts. Suitable for use as exchangeable current transfer elements on galvanising barrels. System specific versions built to specifications or drawing are possible.

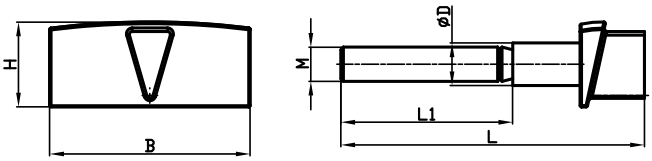


Part No.	Max. load	Dimensions mm L	L_1	D	D_1	SW	Weight kg/piece
51170	300 A	115	65	95	33	46	2,20
51185	400 A	130	70	140	40	70	4,30

Note: The thread G is available in M24 or as pipe thread. Please indicate which threading you like when ordering.

V-formed Contacts
for Electroplating Barrel Systems

Stable contacts in a V form with different thread lengths. Suitable for contacts 51301/51305. Special versions upon request.

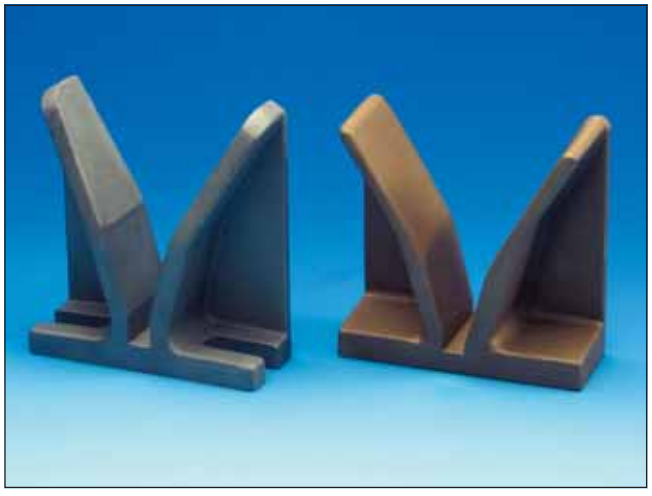


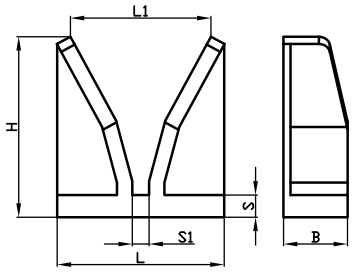
Part No.	Max. load	Dimensions mm L	L_1	B	H	D	Weight kg/piece
51310	300 A	185	70	140	60	30	1,70
51315	300 A	235	120	140	60	30	1,90

Note:
Standard threading M24, others available upon request.

V-formed Support Contacts

Part No. 51301 = current conducting contact made of red brass and suitable for holding a V-formed counter contact 51310 and 51315. Under certain conditions, this can be used for the 10 mm thick rectangular bus-bar. Part No. 51305 = non conducting stable contact made of aluminium alloy.





Part No.	Max. load	Dimensions mm L	L_1	B	H	S	S_1	Weight kg/piece
51301	300 A	120	105	45	135	15	10	1,90
51305	-	120	105	45	135	15	10	0,70

Note: Part No. 51305 double sided with standard 14 x 35 mm drill holes. Part No. 51301 standard without drilling.

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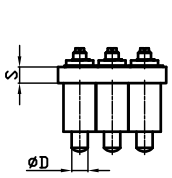
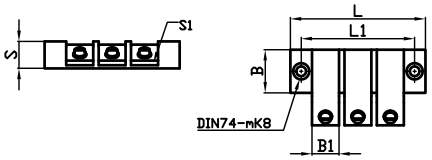
Contactors for Barrel Units

Contactor for transferring motor current in galvanising barrel units. The standard version is not screen protected and consists of a lower and an upper piece. Part No. 51205 = upper piece consisting of 3 spring loaded round contacts and the suitable lower piece 51200. Part No. 51215 = 1 set upper piece consisting of 3 loose contact fingers and the respective lower piece 51210. Versions of this with more poles or different measurements depending on your application are also available upon request.

Part No. 51205

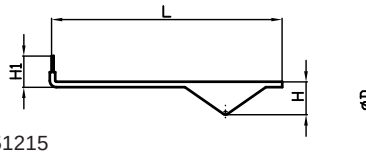


Part No. 51200

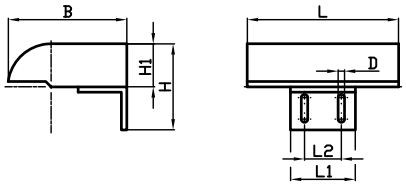


Part No.	Description	Dimensions mm L	L_1	B	B_1	S	S_1	D	D_1	Weight kg/piece
51200	Lower piece	125	105	40	25	25	5	-	-	0,40
51205	Upper piece	100	60	100	15	15	-	15	11	0,60

Part No. 51215



Part No. 51210

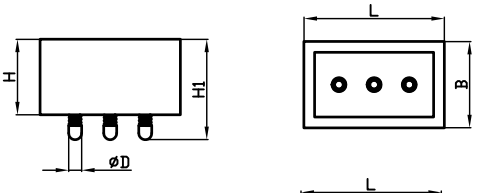


Part No.	Description	Dimensions mm L	L_1	L_2	B	H	H_1	D	Weight kg/piece
51210	Lower piece	140	60	30	110	80	40	10	1,20
51215	Upper piece/Set	210	-	-	10	30	25	5,5	0,40

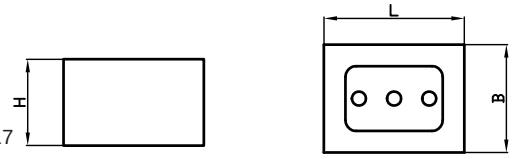
Screen Protected Contactors for Barrel Units

Three phase contacts for transferring motor current in galvanising barrel units. The lower piece of the unit is screen protected in the contact area (IP 20/finger safe). The cable connections are also protected in the housing of the upper and lower pieces. Contact is therefore suitable for 42 V motors as well. If desired, the upper and lower pieces can be equipped with fastening angles.

Part No. 51218



Part No. 51217



Part No.	Description	Dimensions mm L	B	H	H_1	D	Weight kg/piece
51217	Lower piece	130	100	80	-	-	1,50
51218	Upper piece	130	80	30	70	12	1,00

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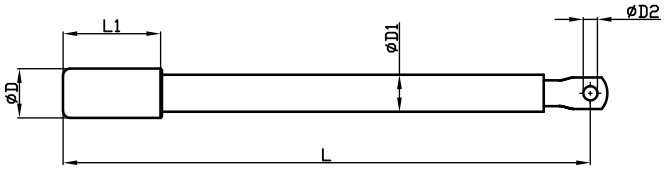
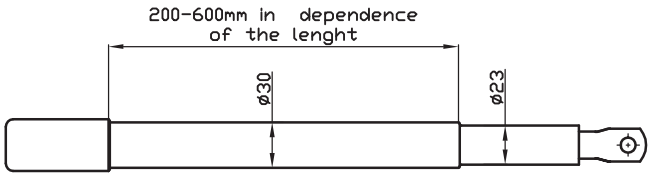
Sealed Contact Cables for Electroplating Barrels
druseidt System with Solderless Pressed Contact Clamps

Long life liquid impervious contact cables with special flexible PVC based covering. The contact clamps are not soldered, they are solderless pressed with an insulated inner conductor as well as with a special liquid resistant outer covering. No other coverings or protective hoses are required. This prevents items from hanging up on other protective elements. The danger of breaking a cable is reduced and the life span is increased. For galvanising barrels having a little access, we have produced a double-insulated contact cable with a split insulation. If desired, we can provide contact cables with extra heat resistant insulation for applications involving high temperatures, dryers etc. Contact cables with contact clamps or different sized connection elements are also available (e.g. 150 mm²). We can produce a number of special versions inexpensively and at short notice.



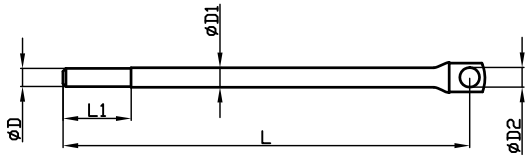
Standard Version



Special Sealed Double Insulated Cable with Split Insulation

Part No. Fe-Tab	Part No. Brass-Tab	Cross section mm²	Dimensions mm L	L_1	D	D_1	D_2
55003 I	**55003 III**	70	600	70	35	25	13
55004 I	**55004 III**		700				
55005 I	**55005 III**		800				
55006 I	**55006 III**		900				
55007 I	**55007 III**		1000				
55008 I	**55008 III**		1100				
55009 I	**55009 III**		1200				
55010 I	**55010 III**		1300				
55023 I	**55023 III**	95	600	70	35	29	13
55024 I	**55024 III**		700				
55025 I	**55025 III**		800				
55026 I	**55026 III**		900				
55027 I	**55027 III**		1000				
55028 I	**55028 III**		1100				
55029 I	**55029 III**		1200				
55030 I	**55030 III**		1300				
55040 I	**55040 III**	120	600	70	35	30	13
55041 I	**55041 III**		700				
55042 I	**55042 III**		800				
55043 I	**55043 III**		900				
55044 I	**55044 III**		1000				
55045 I	**55045 III**		1100				
55046 I	**55046 III**		1200				
55047 I	**55047 III**		1300				

Contact Cables for Hanging Barrels 6/12 V
Transparent, Insulated,
with Exchangeable Brass Tab



Part No. Brass Tab	Cross section mm²	Dimensions mm L	L_1	D	D_1	D_2
55058	25	420	45	15	13	13
55060		540				
55062		600				
55064		900				

Note: The standard lengths shown here refer to the hanging barrel galvanising units shown on pages 3/28 to 3/30 of this catalogue. Different lengths are available upon request.

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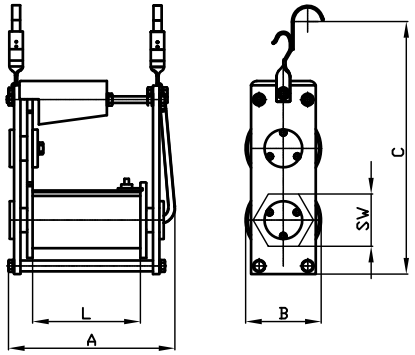
Suspended Galvanising Barrel Units and Replacement Barrels

We supply hanging barrel galvanising units as well as single and double barrel units made of plexiglass, polypropylene or PE 500. Various standard sizes, perforations and styles provide you with a large assortment to choose from in order to satisfy your specific application requirements. **All standard variations are provided with contact cables. If desired, we can provide you with rod versions up to a wrench size of 200 mm or washer contacts.** Barrel units or replacement parts such as sprocket gears for example made according to your pattern or drawing are no problem to supply. If you require barrel units which are not included in our standard program, please specify your requirements.

Suspended Galvanising Barrel Units

Plexiglass (PL) or Polypropylene (PP)



Part No. Type: PL	Part No. Type: PP	Fill quantity	L	SW	Dimensions mm A	B	C	DC-Motor 6-12 V reversible	Weight kg/piece
34411 PL	**34411 PP**	1,5 kg	150	100	270	140	440	7,2 Nm	5,0
34412 PL	**34412 PP**	2,0 kg	200	100	320	140	440	7,2 Nm	5,5

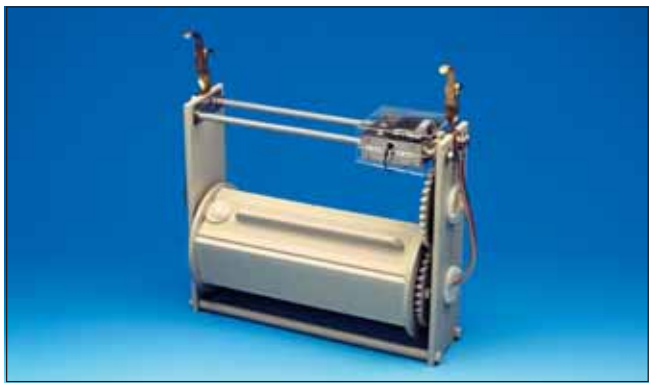
Replacements

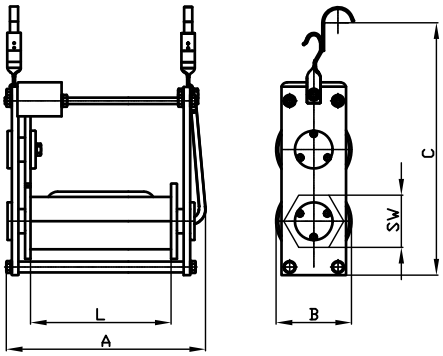
34000 DC replacement motor – Reversible 6-12 V, 7.2 Nm **55058** Replacement contact cable with exchangeable contact tab

Note: Suitable for small lots of small pieces. Galvanising power is motor power as well. Barrel rotations 10 RPM. Standard Barrels with profiled inner walls. Possible perforations: PL Ø from 1.0 mm / = from 0.5 mm, PP Ø from 1.0 mm / = from 0.5 mm. **The standard perforation that we deliver is Ø 2.0 mm.** If you require another perforation, please indicate this in the order. Besides the standard version, 12 or 24 Volt DC motors are also available.

Suspended Galvanising Barrel Units

Plexiglass (PL) or Polypropylene (PP)





Part No. Type: PL	Part No. Type: PP	Fill quantity	L	SW	Dimensions mm A	B	C	DC-Motor 6-12 V reversible	Weight kg/piece
34421 PL	**34421 PP**	6 kg	250	180	400	225	540	7,2 Nm	7,5
34422 PL	**34422 PP**	7 kg	300	180	450	225	540	7,2 Nm	8
34423 PL	**34423 PP**	9 kg	350	180	500	225	540	7,2 Nm	8,5
34424 PL	**34424 PP**	12 kg	450	180	600	225	540	7,2 Nm	8,8
34431 PL	**34431 PP**	7 kg	250	180	400	225	575	15 Nm	8,8
34432 PL	**34432 PP**	8 kg	300	180	450	225	575	15 Nm	9
34433 PL	**34433 PP**	10 kg	350	180	500	225	575	15 Nm	9,2
34434 PL	**34434 PP**	13 kg	450	180	600	225	575	15 Nm	9,7

Replacements

34000 DC replacement motor – Reversible 6-12 V/ 7.2 Nm **34002** DC replacement motor – Reversible 6-12 V/ 15 Nm

55060 Replacement contact cable with exchangeable contact tab

Note: Suitable for small lots of small pieces. Galvanising power is motor power as well. Barrel rotations 10 RPM. Standard Barrels with profiled inner walls. Possible perforations: PL Ø from 1.0 mm / = from 0.5 mm, PP Ø from 1.0 mm / = from 0.5 mm. **The standard perforation that we deliver is Ø 2.0 mm.** If you require another perforation, please indicate this in the order. Besides the standard version, 12 or 24 Volt DC motors are also available.

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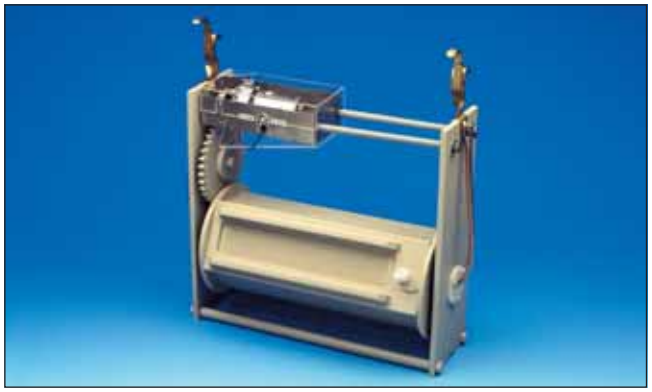
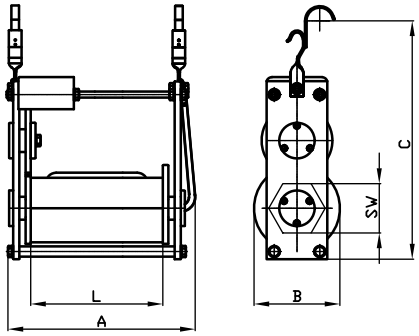
Suspended Galvanising Barrel Units

Polypropylene (PP)





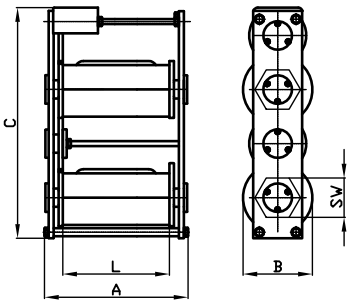
Part No.	Fill quantity	L	SW	Dimensions mm A	B	C	DC-Motor 6-12 V Reversible	Weight kg/Piece
34440	1,5 kg	150	100	270	140	140	7,2 Nm	5,0
34441	2 kg	200	100	320	140	140	7,2 Nm	5,5
34442	6 kg	250	145	400	180	515	7,2 Nm	7
34443	7 kg	300	145	450	180	515	7,2 Nm	8
34444	8 kg	250	180	400	225	540	7,2 Nm	7,8
34445	9 kg	300	180	450	225	540	7,2 Nm	8
34446	10 kg	350	180	500	225	540	7,2 Nm	8,6
34447	12,5 kg	450	180	600	225	540	7,2 Nm	9,2
34448	9 kg	250	180	400	225	575	15 Nm	9,1
34449	10 kg	300	180	450	225	575	15 Nm	9,3
34450	12 kg	350	180	500	225	575	15 Nm	9,5
34451	14,5 kg	450	180	600	225	575	15 Nm	10
34452	12 kg	250	200	400	245	575	15 Nm	9,8
34453	13 kg	300	200	450	245	575	15 Nm	10,8
34454	15 kg	350	200	500	245	575	15 Nm	11,7
34455	16 kg	450	200	600	245	575	15 Nm	12,3

Replacements **34000** DC Replacement motor – Reversible 6-12 V/ 7.2 Nm **34002** DC Replacement motor – Reversible 6-12 V/ 15 Nm
55060 Replacement contact cable with exchangeable contact tab

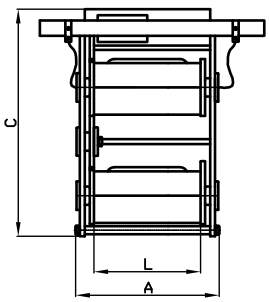
Note: This is suitable for galvanising small parts on a mass basis. Versions with wider lid openings formed sealing covers. The power used for galvanising is the motor power as well. Possible perforations: Ø 1.0 mm/ = 0.5 mm. **Standard perforation 2.0 mm.** If different perforations are required, please indicate your requirements in the order. If desired, 12 and 24 Volt DC motors or versions with perforation blocks Ø 20 mm (Perforation / = 0.2 mm/ • 0.4//0.8 or 1.0 mm) for improved throughput are also available.

Double Barrel – Galvanising Units

Plexiglass (PL) or Polypropylene (PP)



Part No. 34436-37



Part No. 34438-39

Part No. Typ: PL	Part No. Typ: PP	Fill quantity	L	SW	Dimensions mm A	B	C	AC-Motor	Weight kg/Piece
34436 PL	**34436 PP**	2 x 12 kg	350	180	490	240	950	3 x 42 V	24,0
34437 PL	**34437 PP**	2 x 16 kg	450	180	590	240	950	3 x 42 V	27,5
34438 PL	**34438 PP**	2 x 12 kg	350	180	490	250	920	3 x 42 V	23,5
34439 PL	**34439 PP**	2 x 16 kg	450	180	590	250	920	3 x 42 V	27,0

Replacements **34006** AC Replacement motor 3 x 42 V, 0.12 KW back geared motor
55060 Replacement contact cable upper barrel **55064** Replacement contact cable lower barrel

Note: Suitable for machine systems with direct transfer to the bus-bars. The hanger unit is prepared on the barrel construction.
The Barrels have profiled inner walls. Possible perforations: PL Ø from 1.0 mm / = from 0.5 mm., PP Ø from 1.0 mm / = from 0.5 mm.
Our standard perforation is Ø 2.0 mm. If you should require different perforations, please specify these in the order.

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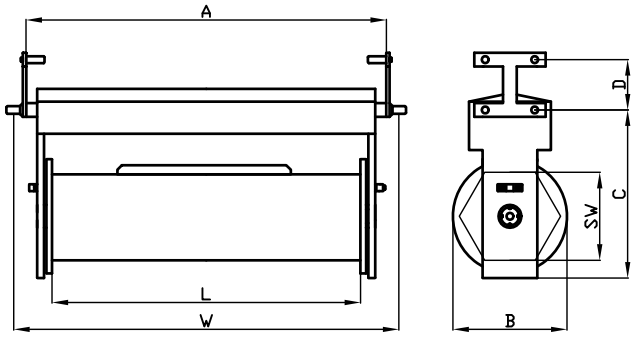
Galvanising Barrel Units

Polypropylene (PP)



Part No.	Fill quantity	L	SW	Dimensions mm A	B	C	D	DC-Motor 12 V	Weight kg/piece
34460	25 kg	500	220	750	270	500	180	15 Nm	22,0

Replacements

34404 DC Replacement motor 12 V/15 Nm

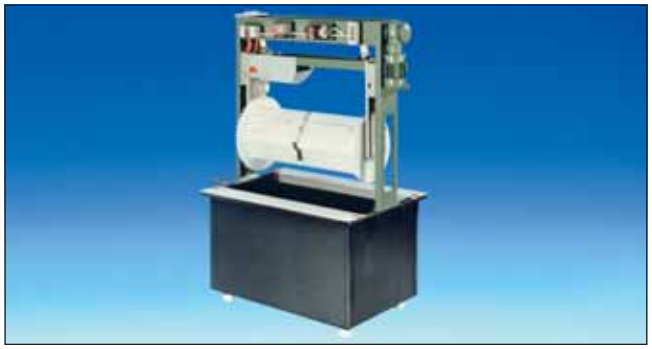
55062 Replacement contact cable with exchangeable contact tab

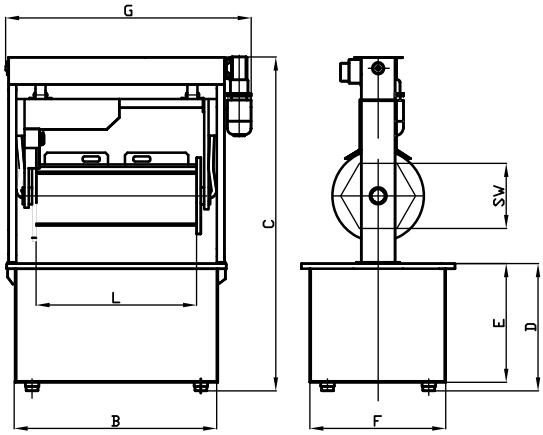
Note: Galvanising barrel unit is 100% polypropylene. It is suitable for automatic systems. With a 3 point rest 20 mm Ø x 180 mm (spacing), one of which is a support tab for motor current. Barrel revolutions 9 RPM standard. If desired, this unit is available with two barrel speeds at extra cost. Barrel turning during lifting and transport by means of installed transport arm. Possible perforations Ø from 1.5 mm / = from 0.5 mm. **Our standard perforations are Ø 2.0 mm.** If different perforations are required, please indicate your requirements in the order. If desired a 24 Volt DC motor or perforation blocks for improved throughput are also available.

Galvanising Barrel Units

With Electrical Motor Lift

Barrel made of PP or PE 500





Part No. Typ PP	Part No. Typ PE 500	Fill quantity	L	SW	Dimensions mm B	C	D	E	F	G
34465 PP	**34465 PE**	95 kg	1000	300	1200	1950	800	700	800	1500
34466 PP	**34466 PE**	110 kg	1000	350	1200	1950	800	700	800	1500

Note: Electrolyte tank with approx. 570 l cubic capacity made of plate steel, rubberised inside and out. Barrels with two piece sealing clamps and 3 mm Ø perforation. Anode bar E-Cu 30 x 10 mm. Operation with geared motor 380 V/400 V DS, 0.18 KW. Barrel rotation 7 RPM, rotates when extended as well. Motor lift with nylon belt over shaft made of stainless steel. Screws and fixing materials are also made of stainless steel. Electrical connection fuse box is installed with motor protection switch.

Replacement Barrels

Material: PP or PE 500.

For galvanising, chroming and phosphatising.

We supply replacement barrels made of various materials in lengths up to 1200 mm and with wrench sizes up to 400 mm made according to the plan or drawing from the customer. All barrels can be configured for existing barrel units.

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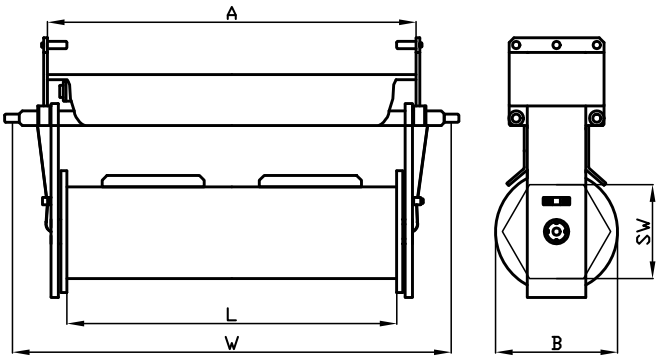
Galvanising Barrel Units

Material: PP or PE 500
As Single or Double Barrel Units

Galvanising barrel aggregate with rubberised steel transport frame (standard) or of stainless steel (special version) and high performance barrels (Smooth opening for faster filling and emptying). The cover comes is optionally one or two pieces with either sealing clamp (standard) or swivel nut (special version). 3 x 42 V DC-Motor 0.18-0.5 KW, Protection to IP 44 with additional acid protection insulation. Transmission by gear-drive with intermediate sprocket gear. Barrel rotation 7 RPM (standard). High current supports with either round bolts, prisms or flat contacts. Transportation elements according to customer demands. Perforation Ø from 1.5 mm / = from 1 mm possible. **Our standard perforation is Ø 3.0 mm.** If different perforation is required, please indicate your requirements in the order. Improved throughput is achieved for the barrel aggregate with another version with corner stabilisers and perforation blocks 40 mm Ø and different perforations. Versions 800/1000 mm long are standard and can normally be delivered at short notice.

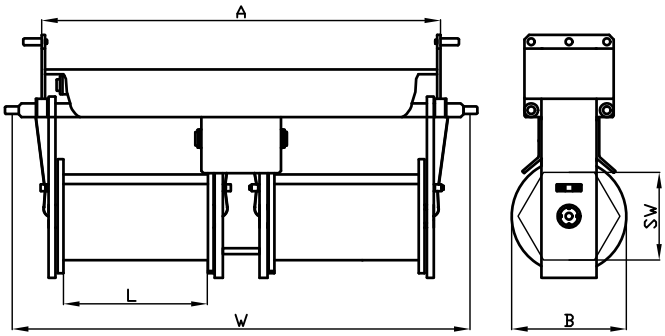
Galvanising Barrel Units
Single Barrel Version



Part No. Typ PP	Part No. Typ PE 500	Fill quantity	Dimensions mm L	SW	W	A	B
34741	**34743**	85 kg	700	300	1000	810	500
34742	**34744**	90 kg		350			
34751	**34754**	90 kg	800	300	1100	910	500
34752	**34755**	100 kg		350			500
34753	**34756**	100 kg		400			560
34761	**34764**	90 kg	1000	300	1300	910	500
34762	**34765**	100 kg		350			500
34763	**34766**	100 kg		400			560
34771	**34774**	100 kg	1200	300	1500	1310	500
34772	**34775**	100 kg		350			500
34773	**34776**	100 kg		400			560

Note: The C and F measurements can be modified according to customer requirements.

Galvanising Barrel Units
Double Barrel Version



Part No. Typ PP	Part No. Typ PE 500	Fill quantity	Dimensions mm L	SW	W	A	G	B
34841	**34843**	2 x 85 kg	700	300	2200	2020	180	500
34842	**34844**	2 x 90 kg		350				
34851	**34854**	2 x 90 kg	800	300	2400	2220	180	500
34852	**34855**	2 x 100 kg		350				500
34853	**34856**	2 x 100 kg		400				560
34861	**34864**	2 x 90 kg	1000	300	2800	2620	180	500
34862	**34865**	2 x 100 kg		350				500
34863	**34866**	2 x 100 kg		400				560

Note: The C and F measurements can be modified according to customer requirements.

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Highly Flexible Copper Connectors
Solderless Pressed Design

These cables are extra flexible. They are made of highly flexible braided strands of 0,07 / 0,10 mm Ø bare or tin coated wire. The ends of the cable have seamless contact areas which have been pressed on under extreme pressure (not soldered). By using this production method material of same analysis and same conductivity (E-Cu tubing and stranded wire) is being connected without using foreign materials like tin or welding additions. This creates a flexible component with very low resistance. Upon request, the current cables can also be insulated with PVC/silicone or another insulating material. For use in galvanising equipment, we also provide liquid resistant versions. We produce customer specific versions to plan or drawing on short notice and inexpensively. The values shown on the next page refer to individual cables and are independent standard values. When cables are run parallel to one-another then the specific current load is similar to DIN 43671. When using insulated connections, the current load capability is decreased by approx. 15 - 20 % of the value in the tables.

In galvanising equipment, these cables perform extremely well for connecting contacts, rectifiers or transformers to the current supply system as well as for compensating for tank movement. We also provide assembled round cables for rectifiers that must have a flexible connection.

Copper Connectors non-insulated

Copper Connectors with Standard Insulation

Copper Connectors liquid-resistant insulated

Round Connectors with and without Insulation

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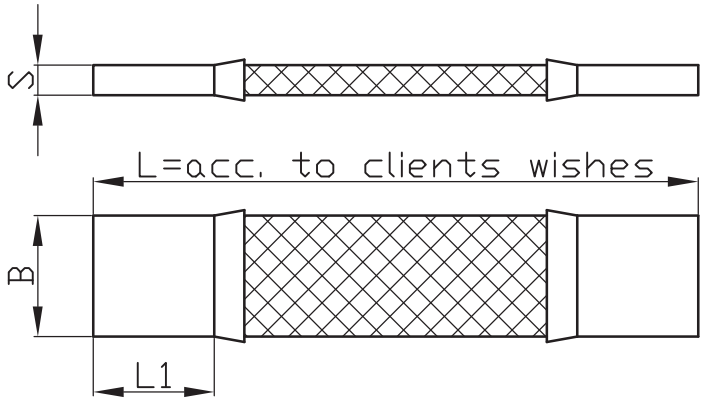
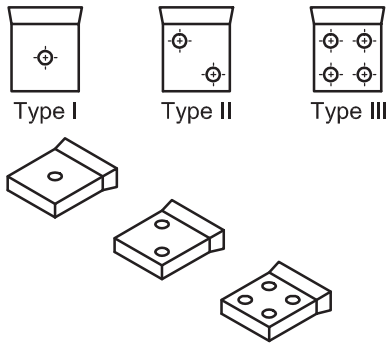
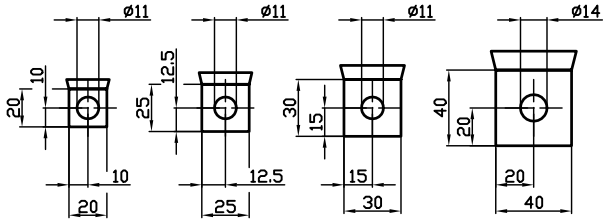
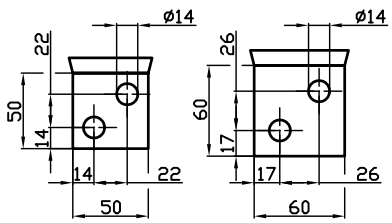
Highly Flexible Copper Connectors
Solderless Pressed Design

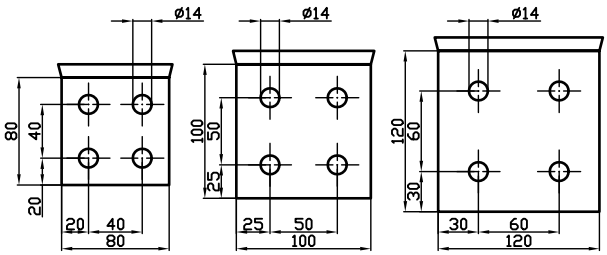




Part No.	Type	Cross section mm²	Dimensions mm approx. B	L_1	S	Load A DC	AC	Standard drilling
02930	I	25	20	20	3,5	150	140	Type I
02931		50			5	250	240	
02932		75			7	350	340	
02933		100			8	400	380	
02934	I	25	25	25	3,5	150	140	
02935		50			4,5	300	280	
02936		75			6	350	340	
02937		100			7	450	420	
02938		125			8,5	500	470	
02939	I	50	30	30	4	300	290	
02940		75			5	400	390	
02941		100			6	450	440	
02942		150			8,5	550	540	
02943		200			11,5	650	640	
02944		300			15,5	800	790	
02945	I	100	40	40	7,5	500	480	
02946		150			7,5	600	590	
02947		200			9,5	700	680	
02948		250			11	800	780	
02949		300			13	900	850	
02950		400			15,5	1000	980	
02951	II	140	50	50	6	650	630	Type II
02952		210			8	800	780	
02953		280			10	950	900	
02954		420			14	1050	1000	
02955		560			16	1350	1200	
02956	II	140	60	60	6,5	700	680	
02957		210			8	900	850	
02958		350			11	1150	1100	
02959		490			13	1350	1300	
02960		560			15	1400	1350	
02961	III	340	80	80	9,5	1200	1100	Type III
02962		500			11,5	1500	1400	
02963		670			14,5	1700	1600	
02964		840			16	1900	1800	
02965		1000			19,5	2100	1950	
02966	III	500	100	100	11	1600	1500	
02967		670			12,5	1850	1790	
02968		840			14,5	2100	2000	
02969		1000			17,5	2250	2150	
02970		1200			19	2450	2350	
02971		1500			23,5	2700	2550	
02972	III	600	120	120	12	1900	1750	
02973		1000			16	2650	2500	
02974		1500			21	3400	3200	
02975		2000			26	3950	3800	
02976		3000			36	4800	4550	
02977		4500			51	5400	5400	







Note: The defined load capacities are independent standard values for non-insulated versions. The reduction factor for insulated versions depending on the application is between 15-20 %. The standard version is non-insulated. Standard insulation is PVC. If desired we can provide materials such as silicone fibre-glass shrinking plastic tubing etc. **If required please indicate: Part No. Overall length; if drill holes are required then please include the type or provide a schematic; if insulation is desired then please indicate specifications. For insulation other than PVC please indicate which type and if they should be impermeable to liquid then please indicate this as well.**

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High Current Carbon Brushes with Special Holders

High current carbon brushes are current transfer elements that continually transfer electrical current from a static component to a moving component or in the opposing direction. These are mainly used to transfer current to a collector such as cylinders, round contacts, etc. We produce and supply high quality heavy duty brush contacts with the respective housings, holders and current supply lines. The dimensioning of these brushes and the type of holder are chosen according to the application and its environment. The quality of carbon is produced using a special procedure which is recognized for is highly specific current load capacities per cm² surface (30-35 A/cm²). To keep voltage drops, especially when working with low voltages, to a bare minimum and guarantee good heat discharge, the surface area of the carbon brushes which actually makes contact should be as large as possible. This has proven itself in applications where several smaller high current carbon brushes per contact point were used instead of one large cross section. To keep the brushes in position, various special holding devices are available such as a single holder, multiple holders or telescopic holder versions. If more current collectors are run, parallel to one-another, then the current load per brush should be reduced by approximately 10-15 %.

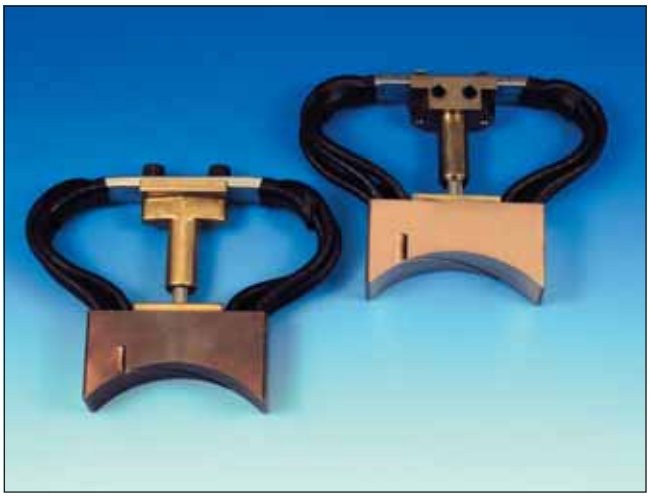
Main Areas of Application

Our high current carbon brushes with holders are normally used:

- in the electrolytic coating of sheets, plates and wires (e.g. galvanising sheets in a rolling mill)
- in galvanising equipment (e.g. copper plating pressure cylinders, chroming rolls)
- in electrophoresis plating for car bodies or other sheet metal parts (e.g. Painting system in the auto manufacturing industry)
- in other systems where high current must be transferred to moving pieces (e.g. mechanical engineering systems, welding systems, wire annealing systems, etc.)

Application Examples

High Current Carbon Brushes with Telescopic Holders



High Current Carbon Brushes with Combination Holders

Water Cooled Contact Unit

4 Piece Contact Unit

The contacts are chosen to suit the respective application. If you are interested please contact us.

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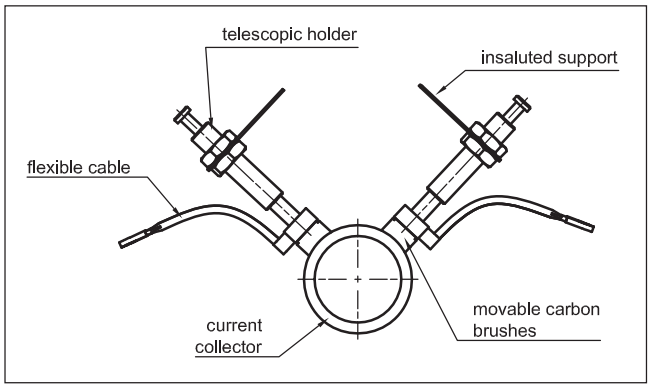
High Current Carbon Brushes with Telescopic Holders



Application Example

When using telescopic holders, the high current carbon brushes hang free and can therefore be easily adjusted to suit the current roll. The pressure on the brushes is created with a cylinder spring in the telescopic holder. The brushes are made either with or without the radius of the current roll and according to the customers requirements. Many different space saving versions of the telescopic holder are available.

Special Quality High Current Carbon Brushes

With flexible current supply lines

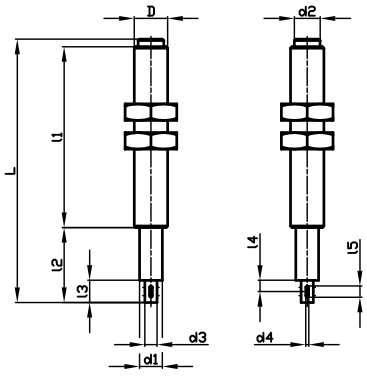
High Current Carbon Brush with riveted-fitting and socket

Part No.	max. load	Dimensions mm	Version	Holder type
35000	250 A	30 x 30 x 23	Riveted armature	Typ 1-2
35002	340 A	40 x 31 x 31	Riveted armature	Typ 1-2
35004	380 A	30 x 45 x 35	Riveted armature	Typ 1-2
35006	450 A	38 x 38 x 40	Riveted armature	Typ 1-2
35008	550 A	50 x 40 x 45	Riveted armature	Typ 3-4
35010	650 A	55 x 40 x 40	Riveted armature	Typ 3-4
35012	550 A	50 x 40 x 45	Pressed cable	Typ 3-4
35014	650 A	55 x 40 x 40	Pressed cable	Typ 3-4

Note: The many different standard dimensions for the high current carbon brushes that we supply can be modified in most cases. For the riveted armature version, the flexible supply cables are installed on the sides of the armature. Versions with extra inserts or different materials such as steel/MS/plastic or stainless steel are also available.

Telescopic Holders for High Current Carbon Brushes

Material: Brass



Telescopic Holders with 15 and 30 mm stroke

Part No.	Type	Spring pressure	stroke	Dimensions mm L	L_1	L_2	L_3	L_4	L_5	D_1	D_2	D_3	D_4	D
35020	1	5 kg	15	118	85	28	10	3,5	5	16	17	7,5	4	M22 x 1,5
35022	2		30	143	95	44	10	5	-	16	17	7,5	4	M22 x 1,5
35026	3	10 kg	15	118	85	28	10	3,5	5	16	17	7,5	4	M22 x 1,5
35028	4		30	143	95	44	10	5	-	16	17	7,5	4	M22 x 1,5

Note: Suitable for high current carbon brushes like Part No. 35000-35014. Max. brush size 50 x 50 mm (length x width). The stroke and the pressure on the brush are configured using the nut on the thread of the holder.

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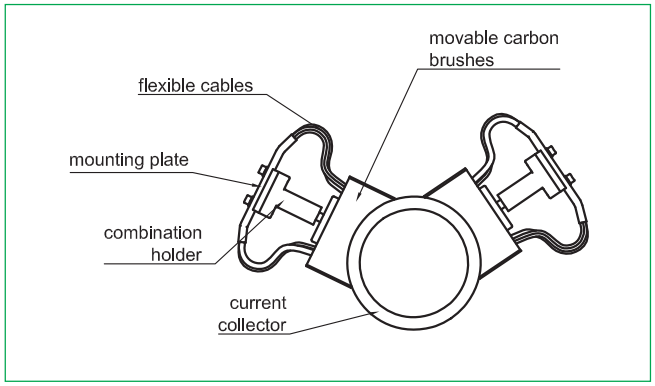
High Current Carbon Brushes with Combination Holder



Application Example

When using combination holders, the high current brush hangs freely and can therefore be easily set up for the current roll. The pressure on the brushes is created by a cylinder spring in the holder housing. The brush can either be made with or without the radius of the current roll and according to the customers requirements. The combination holders can be chosen and configured to fit the application requirements and take up very little space. The high current brush holders H_1 and H_2 (fastened horizontally) are screwed directly onto the current supply bar. High current brush holders V_1 and V_2 can be mounted on the side of a housing or other fixed part (fastened vertically).

Special Quality High Current Carbon Brushes

With flexible current supply lines

High Current Carbon Brush 1000 A Part No. 35038

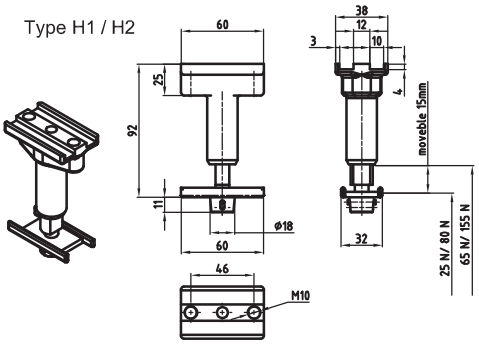
Part No.	max. load	Dimensions mm	Suitable Holder
35034	600 A	36 x 70 x 32	Typ H_1/V_1
35036	600 A	36 x 70 x 45	Typ H_1/V_1
35038	1000 A	36 x 100 x 45	Typ H_1/V_1
35040	600 A	70 x 36 x 40	Typ H_1/V_1
35042	750 A	65 x 48 x 40	Typ H_1/V_1
35044	1000 A	80 x 40 x 95	Typ H_2/V_2
35046	1200 A	120 x 40 x 60	Typ H_2/V_2

Note: High current carbon brushes in the standard dimensions in the table are also available in customer specific dimensions. The amount and type of flexible supply lines are defined according to the current load and are configured and set up for the application before they are delivered.

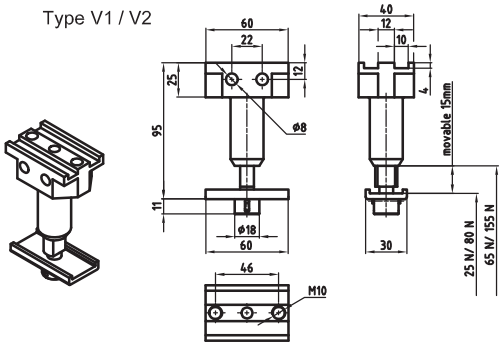
Combination Holders for High Current Carbon Brushes

Material: Brass
Minimum Brush Size 70 x 36 mm

Type H1 / H2



Type V1 / V2



Part No.	Type	Pressure	Fastening
35050	H_1	25/ 65 N	Horizontally
35052	H_2	80/155 N	Horizontally
35054	V_1	25/ 65 N	Vertically
35056	V_2	80/155 N	Vertically

Note: Type H_1/H_2 can be mounted together with the connection cable of the brush directly to the current supply bar.
Type V_1/V_2 is fixed on the side with two M8 screws to a non-current carrying part. The connecting cables of the brush are either screwed onto the current supply bar or to a flexible Cu cable on the holder.

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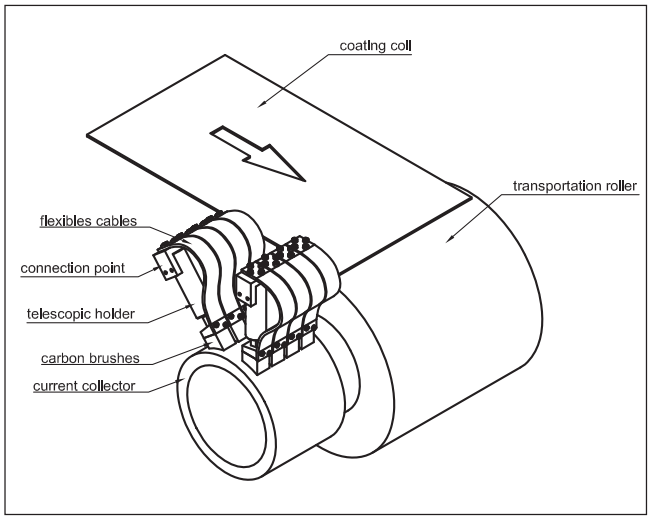
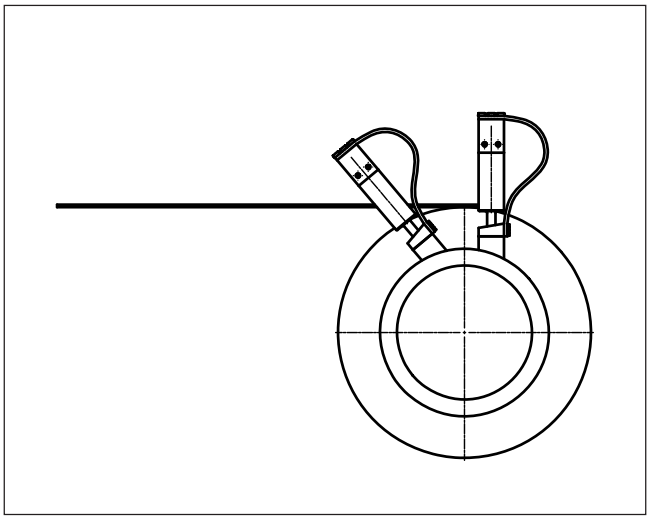
High Current Carbon Brushes and Holders
For Coil Coating Equipment

For the electrolytic coating of coils, in coil galvanising equipment for example, we supply special quality carbon high current brushes with or without holders. The insulation and type of cable can be chosen to suit the environmental temperature and the chemicals used. This in combination with good friction behaviour of the brushes makes a durable and optimal price/performance ratio. Holders that are made respectively allow the brushes to hang freely so that they can be perfectly adapted to the current roll.

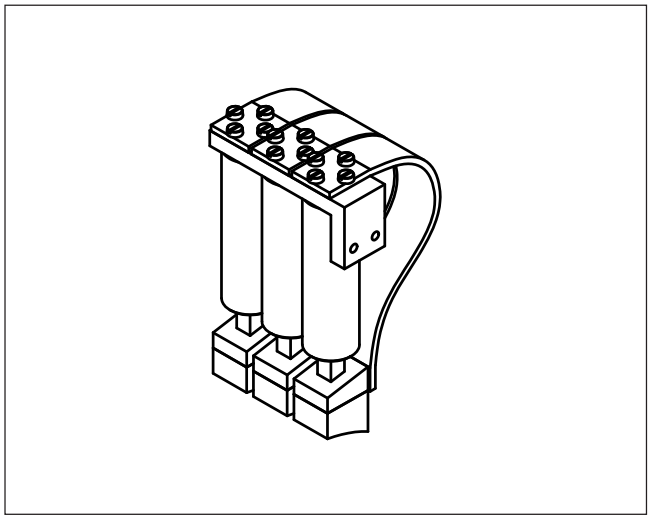


Application Example

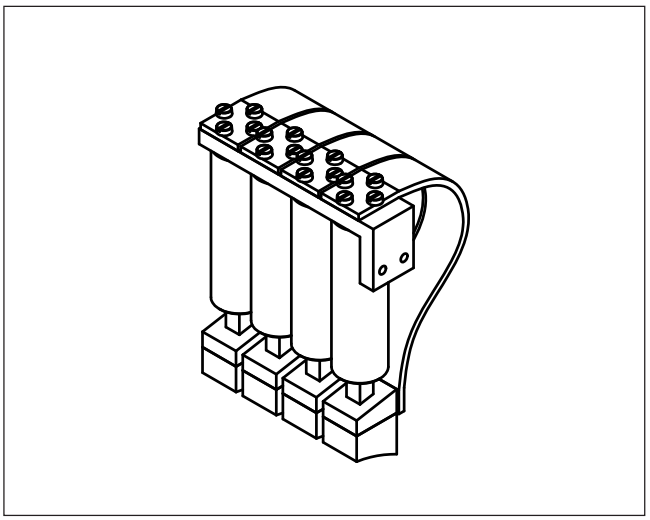


Side View

Example: Contact Units with Telescope Holders



3 Piece Contact Unit
Brush Size 35 x 42 x 50 mm
Load 750 A



4 Piece Contact Unit
Brush Size 35 x 42 x 50 mm
Load 1000 A

With the help of our customers we are developing current transfer solutions as well as producing replacement parts made to plan or drawing for existing systems.

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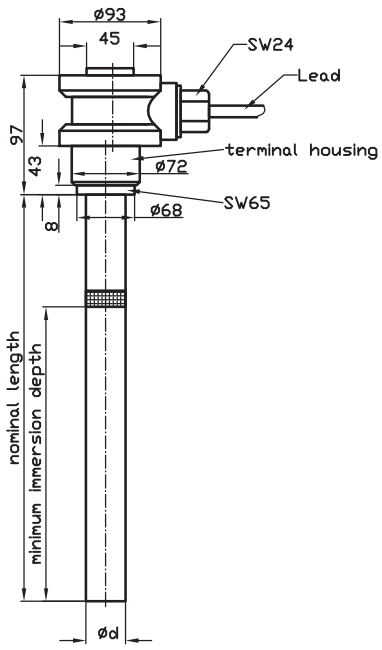
Safety – Immersion Heater ROTKAPPE®



Tubing length mm	Minimum submerging depth mm	Performance Kw	Tubing material/type Part No. Type PS	Part No. Type TG	Part No. Type QS	Part No. Type KB	Part No. Type SB	Part No. Type TI	Part No. Type KS	Part No. Type FC
315	225	0,4	**54300**	**54330**	**54360**	**54390**	**54430**	**54490**	**54460**	**54520**
315	225	0,63	**54301**	**54331**	**54361**	**54391**	**54431**	**54491**	**54461**	-
400	275	0,63	**54302**	**54332**	**54362**	**54392**	**54432**	**54492**	**54462**	**54522**
400	275	1	**54303**	**54333**	**54363**	**54393**	**54433**	**54493**	**54463**	-
500	360	1	**54304**	**54334**	**54364**	**54394**	**54434**	**54494**	**54464**	**54524**
500	360	1,4	**54305**	**54335**	**54365**	**54395**	**54435**	**54495**	**54465**	-
630	460	1,25	**54306**	**54336**	**54366**	**54396**	**54436**	**54496**	**54466**	**54526**
630	460	1,6	**54307**	**54337**	**54367**	**54397**	**54437**	**54497**	**54467**	-
630	460	2	**54308**	**54338**	**54368**	**54398**	**54438**	**54498**	**54468**	-
800	560	1,6	**54309**	**54339**	**54369**	**54399**	**54439**	**54499**	**54469**	**54529**
800	560	2	**54310**	**54340**	**54370**	**54400**	**54440**	**54500**	**54470**	-
800	560	2,5	**54311**	**54341**	**54371**	**54401**	**54441**	**54501**	**54471**	-
1000	725	2	**54312**	**54342**	**54372**	**54402**	**54442**	**54502**	**54472**	**54532**
1000	725	2,5	**54313**	**54343**	**54373**	**54403**	**54443**	**54503**	**54473**	-
1000	725	3,15	**54314**	**54344**	**54374**	**54404**	**54444**	**54504**	**54474**	-
1250	875	2,8	**54315**	**54345**	-	**54405**	**54445**	**54505**	**54475**	**54535**
1250	875	3,5	**54316**	**54346**	-	**54406**	**54446**	**54506**	**54476**	-
1600	1125	3,15	-	-	-	-	-	-	-	**54537**
1600	1125	3,50	**54317**	**54347**	-	**54407**	**54447**	**54507**	**54477**	-
1600	1125	4,5	**54318**	**54348**	-	**54408**	**54448**	**54508**	**54478**	-
2000	1400	4	-	-	-	**54409**	**54449**	**54509**	**54479**	**54539**
2000	1400	5	-	-	-	**54410**	**54450**	**54510**	**54480**	-

Note: Tubing and heating rods are supplied for all versions as replacement parts.

Submerged Tubing Material - Stocked

Material	Type	Tube Ø mm	Material	Type	Tube Ø mm
Special Hard Porcelain	PS	54	Stainless Steel 1.4571	KB	45
Technical Glass	TG	50	Steel ST 34-2	SB	45
Quartz	QS	52	Titanium 3.7035	TI	45
PTFE-Compound	FC	48	Corrosion resistant Special alloy	KS	45

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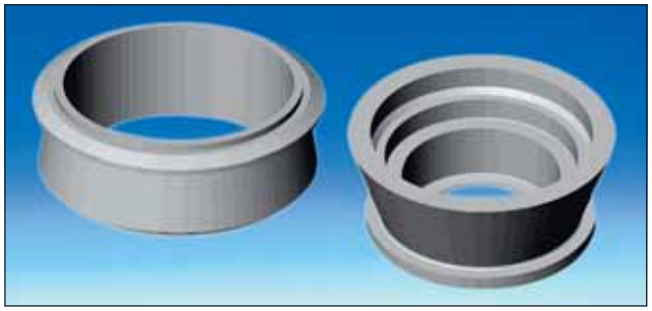
Safety – Angled Immersion Heater ROTKAPPE®

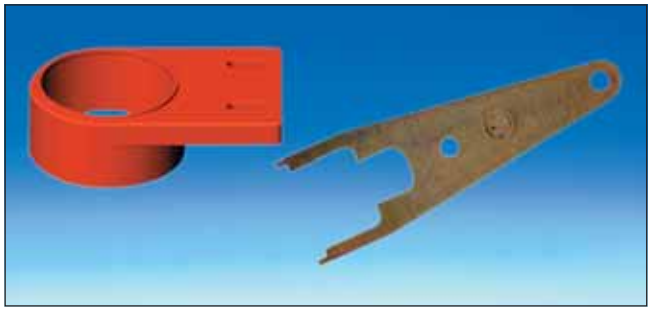
These units are especially suited for heating shallow tanks. These consist of a horizontal submergible tube for which the length depends on the electrical proportions and a vertical unheated tube for which the length depends on the depth of the tank and can be as long as is required. To avoid endangering heat sensitive support housings, the horizontal heated tubing is equipped with two 50 mm high angular supporting feet. Angled heaters are produced according to the application requirements. We can supply versions with horizontally heated submergible tubing e.g. stainless steel, up to a length of 3,000 mm and a performance of up to 12 kW. Please be sure to include your individual specifications when ordering.

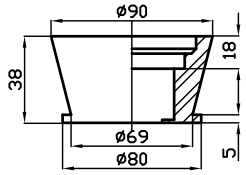
Protective Tubing for Immersion Heaters

Part No.	For submergible tubing length mm	Note
54725	315	Protective tubing with welded holder and sleeves protect sensitive submergible tubing (porcelain, glass, PTFE) from mechanical dangers and enable a secure hold on the tank edge. Material: Protective Tubing/Holder - PP, Sleeves - EPDM.
54726	400	
54727	500	
54728	630	
54729	800	
54730	1000	
54731	1250	
54732	1600	
54733	2000	

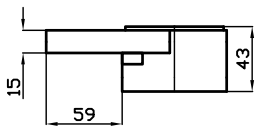
Accessories for Immersion Heaters

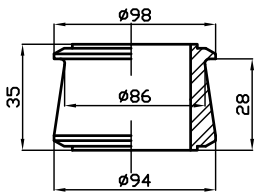




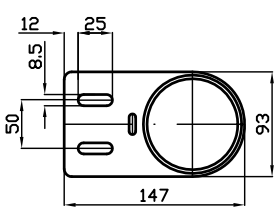


Part No. 54750





Part No. 54751



Part No. 54760

Part No.	Item	Description
54750	Holder Sleeves Material: EPDM	For holding in tank traverse Drill holes - Ø 70-76 mm
54751	Installation Sleeves Material: EPDM	For space saving installation in holders or Tank traverse Drill holes - Ø 87-90 mm
54760	Holder (to screw on) Material: PP	For fixing immersion heaters to the tank edge up to a tubing length of 800 mm.
54780	Universal Wrench	For opening and closing the clamping housing as well as for de-installing the ring nut and the cable threading.

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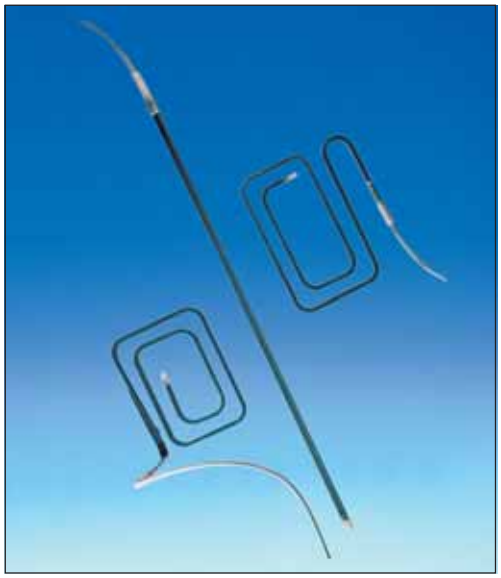
PTFE-Heating Rods Galmaflex/Galmaform

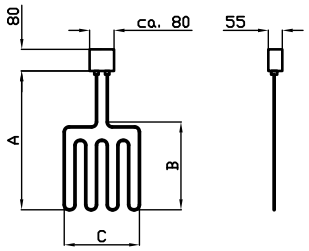
Formed heating rods with PTFE casings are suitable for direct heating of aggressive liquids. They can be formed individually and allow the rod to be used according to the area and shape of the individual tank. The minimum bending radius for products 17555 and 17560 is 20 mm or for products 17580 and 17581 30 mm. Heating rod Galmaflex Part No. 17555/17560 are especially suitable for heating highly aggressive liquids in production or laboratory environments. Heating liquid processes in a sanitary environment is enabled with a pure white PTFE shell. Galmaform heating rods Part No. 17580/17581 are especially suited for heating aggressive liquids in the engraving, etching and galvanising industries. A special PTFE compound shell for part No. 17581 optimises the heat conductivity and therefore the heat throughput so that the a performance of 2000 W is achieved. The pure white shell for part No. 17580 is not electrically conductive and prevents metal reduction. This enables the direct heating of auto catalytic (chemical) functioning electrolytes. This type is also recommended for use in sanitary environments.



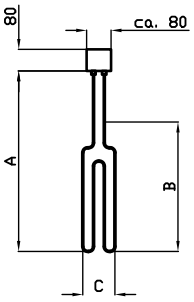
Part No.	Rated power watt	Dimensions mm length	Heated length	Rod W x H	Min. bending radius	Rated voltage	Sleeves material
For laboratory and smaller systems GALMAFLEX®							
17555	400	800	650	15x7,5	20	230 ~	PTFE-pure white
17560	800	1400	1250	15x7,5	20	230 ~	PTFE-pure white
17565	Holder						
17570	Spacing angle						
For larger systems GALMAFORM®							
17580	1750	2500	2390	13 Ø	30	230 ~	PTFE-pure white
17581	2000	2500	2390	13 Ø	30	230 ~	PTFE-comp.
17585	Holder						
17586	Spacing angle						

Safety – Flat Immersion Heater ROTAFLON®

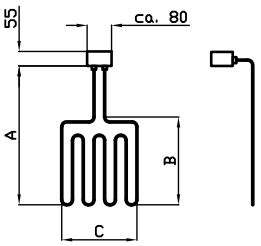
This units are especially suited to directly heating aggressive liquids in shallow circuit board trays and e.g. engraving, etching or galvanising equipment. Because of their chemical resistance and electrical properties, these meet the highest standards. The extremely smooth, anti-adhesive surface of the PFA material (Teflon) and a low degree of surface stress prevent scaling on the flat immersion heater which decreases timely maintenance chores. Construction: Stainless steel heating element – PFA without sleeve. Connection housing – Protection IP 64/DIN 40050, Material PVDF. Connection lines 1.6 m long and made of PVC with coated safety connection. The flat immersion heater is attached with 4 drill holes which lie outside of the cover seal. Standard version for AC. Other voltages and performance available upon request.



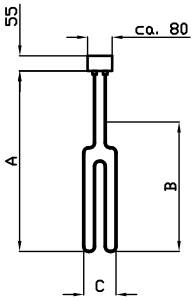
Type I



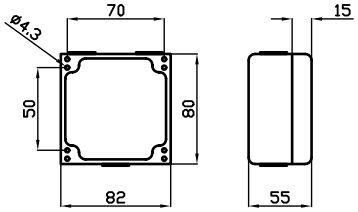
Type II



Type III



Type IV



Clamp Housing

Part No.	Type	Rated power kW	Outer tube Ø	Dimensions mm Install. length A	Min. submerge depth B	Total width C	Rated voltage
17592	I	2,0	14	750	365	460	230 V ~ (AC)
17593	II	2,0	14	680	365	460	230 V ~ (AC)
17594	III	2,0	14	1100	725	200	230 V ~ (AC)
17595	IV	2,0	14	1040	725	200	230 V ~ (AC)

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Temperature Controllers / Immersion Heaters with Built-in Temperature Controllers

The Rotkopf temperature controller is used for automatically maintaining a defined set temperature. A change in temperature causes the volume to change in a liquid filled measurement system which moves the switching membrane. This activates a switching contact. To avoid measurement errors, please ensure that the active measurement length of 100 mm is already submerged in the liquid. The thermostat is contained in the housing of the attachment which is made of PP and is protected to IP 64 DIN 40050. By opening the cover of the housing with the universal wrench Part. No. 54780, you can access the temperature setting head and the attachment position. The maximum switching power is 2300 W/250 V (AC). The temperature controller is supplied with a connection length of 1.6 m without connector.
For tanks having a performance of maximum 2 Kw for maintaining the operating temperature, we can supply immersion heaters with inbuilt temperature controllers. This built-in temperature controller is well matched to the material of the submergible tubing with its chemical resistance and automatically controls the temperature according to the defined set value. This enables a direct connection to an outlet without requiring any other switching elements. These devices are equipped with a 1.6 m long PVC line and a coated shock-proof plug as standard. Longer cables an be supplied upon demand. For extreme temperature burden on the housing or if chemicals with high oxidation levels (e.g. chrome-electrolyte HNO_3), the housing made of PVDF should be used.

Rotkopf Rod Type Thermostat

Part No.	Dimensions mm Tubing rated length	Active length	Control range	Switch difference	Contact type	Switching power	Switching voltage	Max switching current
54630	300	100	0 - 120° C	6 K	1 change-over switch	2300 W	250 V (AC)	10 A / 7 A
54632	500	100	0 - 120° C	6 K	1 change-over switch	2300 W	250 V (AC)	10 A / 7 A
54634	800	100	0 - 120° C	6 K	1 change-over switch	2300 W	250 V (AC)	10 A / 7 A

Submergible Tubing Material – Stocked:
B = Stainless Steel W-No. 1.4571 **F** = Polypropylene (PP) **G** = Teflon (PTFE) **L** = Polyvinyl fluoride (PVDF)
If required, please indicate Part No. + Material Code (letter) for tubing material

Immersion Heater with Built-in Temperature Controller

Tubing rated length mm	Min. submerge depth mm	Rated power Kw	Submergible tubing / type Part No. Type PS	Part No. Type TG	Part No. Type QS	Part No. Type KB	Part No. Type KS	Part No. Type TI
315	225	0,63	**54550**	**54560**	**54570**	**54580**	**54600**	**54610**
400	275	1,0	**54551**	**54561**	**54571**	**54581**	**54601**	**54611**
500	360	1,4	**54552**	**54562**	**54572**	**54582**	**54602**	**54612**
630	460	2,0	**54553**	**54563**	**54573**	**54583**	**54603**	**54613**
800	560	2,0	**54554**	**54564**	**54574**	**54584**	**54604**	**54614**
1000	725	2,0	**54555**	**54565**	**54575**	**54585**	**54605**	**54615**

Submergible Tubing Material

Type	Immersion heater tubing	Controller tubing
PS	Porcelain	PP
TG	Technical Glass	PP
QS	Quartz	PP
KB	Stainless Steel 1.4571	Stainless Steel 1.4571
KS	Corrosion resistant special alloy	PP
TI	Titan	PTFE

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Microprocessor Controlled Temperature Regulators

Our microprocessor controlled temperature regulators are used for automatically regulating temperature where precision is an important factor. A key pad on the front of the unit is used to digitally define the parameters and set values. The switching states of the output relays are indicated via LEDs. The regulator can be ordered with one set value (Part No. 56555) or with two definable set values and an additional limit contact (Part No. 56556). The limit contact functions as a control deviation alarm on set value 1, i.e. as soon as the actual value differs from the defined set value by ± 10 K, the limit contact is activated. The hysteresis can be defined symmetrically between 1-99. Keys can be locked so that the set value cannot accidentally be changed over the key-pad. The actual value is displayed on a three digit, 14 mm high, digital LED display. The key pad is covered with a chemical resistant polyethylene material.
The regulator can be built into the switching panel and protected to IP 50. If desired, the regulator can also be supplied with plastic housing and/or splash proof cover so that protection is increased to IP 64. The connection of a Pt 100 temperature sensor is possible with 3 phase power. The temperature regulators are equipped with sensor damage and short-circuit recognition which switches off the heating or other elements when the sensor is damaged.

Part No. with one set value	**Part No. with two set values and one limit contact**	Description
56555	**56556**	For switching panels, front surface 72 x 72 mm, cut-out area 66 x 66 mm
56555.11	**56556.11**	With splash proof cover, Protection IP 64, Dimensions 80 x 88 x 30 mm
56555.06	**56556.06**	With housing, Protection IP 50, Dimensions 160 x 120 x 140 mm
56555.09	**56556.09**	With housing and splash proof cover, Protection IP 64, Dimensions 190 x 120 x 140 mm

Technical Data

Operating Voltage	230 V AC + 10 % / - 15 %	Frequency 50-60 Hz	
Temperature Range	– 99°C to + 600°C	Switching Current	5 A
Switching Power	1150 W / 230 V AC	Switching Precision	1 K
Contacts 56555	1 change-over switch	Contacts 56556	2 change-over switch with extra limit contact
Environ. Temperature	0 to 55°C	Relative Humidity	max. 75 %, non-condensing
Protection	Front IP 50	Temperature Sensor	Pt 100 DIN IEC 751, 3-phase

Temperature Sensor

with Pt 100 Sensor DIN IEC 751

The temperature sensors described here are suitable for combining with temperature regulators 56555/56556. These provide a minimum deviation, exact temperature measurement of the process medium. We can supply two different version. One has a protective tubing made of teflon PFA and works under temperatures up to 200°C. The second version has rigid, robust submergible tubing in various lengths and materials. The temperatures under which this unit can operate are maximum 90/100°C. These devices are equipped with a splash proof housing (IP64). Sensors with teflon tubing are only utilised for a line extension with a housing.

Part No.	Description
56520	Temperature sensors without housing, with PFA tubing 1.6 m
56521	same, but with housing and PFA tubing 1.6 m
56525	Temperature sensor with submergible tubing, 300 mm
56527	Temperature sensor with submergible tubing, 500 mm
56530	Temperature sensor with submergible tubing, 800 mm

Submergible Tubing Material – Stocked
B = W-No. 1.4571 **F** = Polypropylene (PP)
G = Teflon (PTFE) **L** = Polyvinyl fluoride (PVDF)
Please indicate the part no. + material code for tubing materials.

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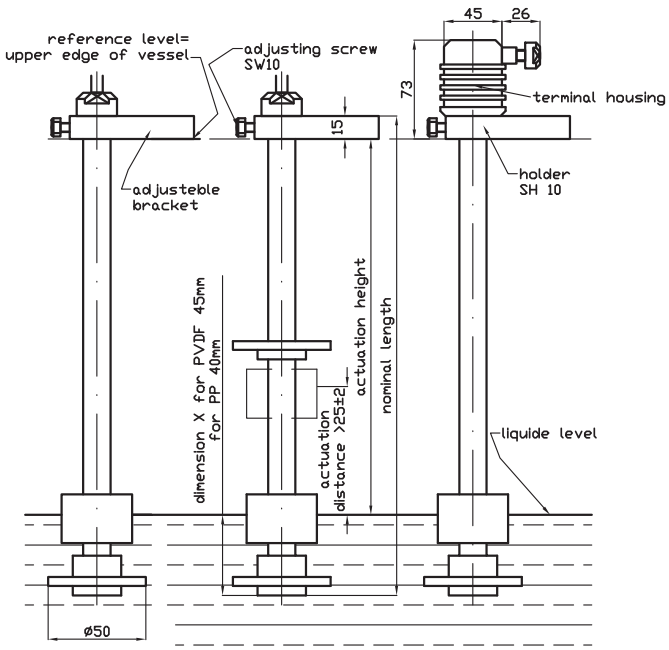
Float Switch for Determining Liquid Levels

This float switch is used for monitoring the level of liquid and for protecting heaters, pumps etc. from drying out. The float switch (Part No. 56672/79) with switching point determines the level of liquid in the tank. Float switches 56675 and 56676 allow the regulation of two different liquid levels in a tank. The upper and lower switching points are regulated with change-over switches. The magnet which is built into the floating contact influences the reed contact which is fixed in the float shaft. If the float sinks to the lower stop then a contact opens or/and closes. On floating switches with two contacts, the switching is done when the float comes close to the upper or lower stop. The floating switches are equipped with an adjustable height mounting clamp. For types with two switching points, 2 reed contacts are built into the units. The switching distance between the contacts is defined by the user in the order and cannot be changed afterwards. The standard cables are 1.6 m long.

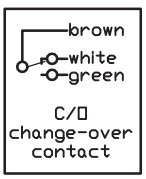
Part No. 56672 Part No. 56675 Part No. 56679



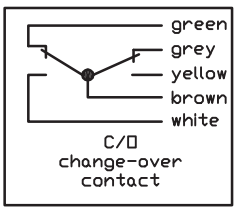
Determining the rated length in cm:
Switch Height + Holder Thickness (1.5 cm) + X = Rated Length

Connection Diagram

Part No. 56672/79



Part No. 56675/76



Part No. Type PP	Part No. Type PVDF	Description
56672 F	**56672 L**	Floating switch, no housing, 1 switching point
56679 F	**56679 L**	Floating switch, housing, 1 switching point
56675 F	**56675 L**	Floating switch, no housing, 2 switching points
56676 F	**56676 L**	Floating switch, housing, 2 switching points

Note: Please indicate the required rated length and the switching distance when ordering.

Technical Data

Operating voltage	max. 250 V AC/0.13 A	Switching delay	None
Switching current	max. 1 A/30 V	Switching hysteresis	5 mm
Switching power	max. 30 W/60 VA	Contact	1 or 2 change-over switches

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Electronic Regulators with Rod-types Level Probes for Dry-Running Protection and Level-Regulation

Electronic level regulators are used in combination with level probes for monitoring levels in tanks and prevent drying out of immersion heaters and other accessories. These function according to the conductivity principle (conductive level measurement). Three types of regulators are available. Type Part No. 56658 monitors the level in a tank as dry-out protection in combination with a double probe or floating switch 56672/79. Regulator 56660 is suitable for determining two levels. A defined liquid level is controlled automatically using minimum/maximum level regulation. The 56660 version is equipped with a switching delay and the switching level is indicated with LEDs. The regulator can be adjusted to suit the conductivity of the liquid being monitored. The sensitivity setting is infinitely variable. The relay output in the housing switches with a certain increase or decrease (static or active contact) depending on the application. For minimum/maximum level regulation, a three fold level probe or a floating switch 56675/76 is required. The 56662 regulator has a fixed switching delay and in addition to the minimum/maximum regulation has an independent switching contact which e.g. switches off the heating when the level drops too much. A four fold probe is required for this. The sensitivity setting is infinitely variable for two regulation circuits.
The level probes to be used with the regulators are either PTFE universal probes with no cover or are metallic (standard stainless steel 1.4571) or, upon request, can be supplied in titanium 3.0735 or Hastelloy. It is also possible to extend the switching height for the metallic versions at a later date.

Application Example

Combination Regulator 56658 + Probe II fold
- Dry-out protected: When level drops below minimum fill level then heating is switched off
- Overflow protected: When tank is full then pumps, intake valves, etc. are switched off/shut
- Leakage and flooding indicators: Set off an alarm when liquid escapes, e.g. in a catch tray, etc.

Combination Regulator 56660 + Probe III fold
- Minimum/Maximum level regulation, i.e. the level is automatically maintained between level 1 and level 2 (automatic on switch when minimum level is reached).

Combination Regulator 56662 + Probe IV fold
- Minimum/Maximum level regulation with additional dry-out protection. If a tank e.g. is emptied because of a broken pipe then the heating unit is switched off automatically.
- Minimum/Maximum level regulation with additional overflow protection contact. If an intake valve is defect for example then an additional alarm is set off when there is a danger of overflow.

Part No.	Description		
56658	Dry-out protection, Probe II fold required		
56660	Level regulator for Minimum/Maximum regulation, Probe III fold required		
56662	Same as 56660 but with additional independent switching contact, Probe IV fold required		
Technical Data:	**Part No. 56658**	**Part No. 56660**	**Part No. 56662**
Construction:	DIN housing 45 x 75 x 105 mm, IP 20 with snap fastener for bus-bar 35 mm DIN 50022. Available in splash proof plastic housing (IP 64) 160 x 120 x 140 mm for table or wall mount upon request.		
Operating Voltage:	230 V AC – 10 % / + 15 %, 48-65 Hz		
Switching Voltage	max. 250 V AC		
Switching Current:	max. 11 A	max. 6 A	max. 6 A
Potential Free Contact	1 change-over contact	1 change-over contact	2 change-over contact; 2 reg. circuits
Switching Delay:	approx. 1 Sec.	0-10 Sec.	approx. 1 Sec.
Sensitivity:	0.1 to 100 kOhm – logarithm settings		
Switching Status Indication:	1 LED	2 LED	2 LED
Environ. Temperature:	-10 to +45°C		
Level Probes – Stocked			
56622	Stainless Steel 1.4571	II fold with PP housing	☐ 45 x 58 mm
56624	Stainless Steel 1.4571	III fold with PP housing	☐ 45 x 58 mm
56625	Stainless Steel 1.4571	IV fold with PP housing	☐ 45 x 58 mm
56623	Universal Probe PTFE	II fold with PP housing	☐ 45 x 58 mm
56626	Universal Probe PTFE	III fold with PP housing	☐ 45 x 58 mm
56627	Universal Probe PTFE	IV fold with PP housing	☐ 45 x 58 mm

Note: If desired, the level probes are also available in titanium 3.7035 or Hastelloy or with larger PP housing Ø 93 x 97 mm. **Please indicate the desired length of the level probe in the order**.

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Off/Isolation Switches
Manually activated
For switching in no-load state

Off/Isolation Switch 1- and 2-pole 1000 A

Part No. 1-pole	Part No. 2-pole	max load
52160	**52200**	400 A
52165	**52205**	600 A
52170	**52210**	1000 A
52175	**52215**	2000 A
52180	**52220**	3000 A
52185	**52225**	4000 A

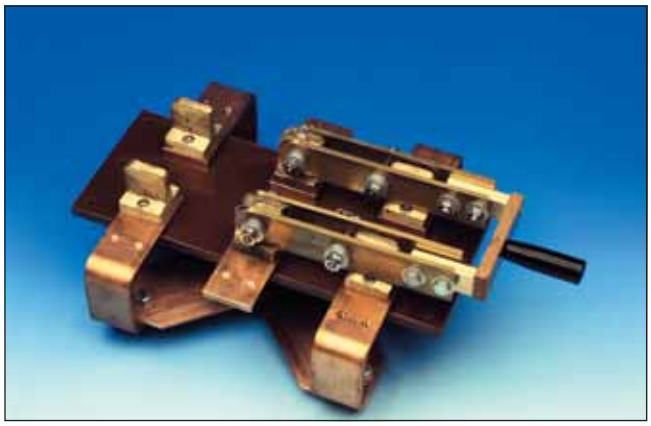
Off/Isolation Switches
Pneumatically activated
For switching in no-load state

Off/Isolation Switch 1-pole 4000 A

Part No. 1-pole	Part No. 2-pole	max. load
52675	**52680**	1000 A
52676	**52681**	2000 A
52677	**52682**	3000 A
52678	**52683**	4000 A

Note: Compact, relatively small modular switch. By combining with individual modules this can be used for larger switching applications over 10 KA.

Change-Over-/Pole Changing Switches
Manually activated
For switching in no-load state



Pole Changing Switch Manually Activated 1000 A

Part No. Change-Over 2-pole	Part No. Pole Changing 2-pole	max. load
52240	**52420**	400 A
52245	**52425**	600 A
52250	**52430**	1000 A
52255	**52435**	2000 A
52260	**52440**	3000 A

Dimensions of all switches on request!

Change-Over-/Pole Changing Switches
Motor activated
For switching in no-load state

Pole Changing Switch Motor Activated 2000 A

Part No. Ch.-Over 2-pole	Part No. Pole Changing 2-pole	Part No. Pole Changing with Time Automation	max. load
52340	**52520**	**52610**	1000 A
52345	**52525**	**52615**	2000 A
52350	**52530**	**52620**	3000 A
52355	**52535**	**52625**	4000 A
52360	**52540**	**52630**	5000 A
52365	**52545**	**52635**	6000 A
52370	**52550**	**52640**	7000 A
52375	**52555**	**52645**	8000 A
52380	**52560**	**52650**	9000 A
52385	**52565**	**52655**	10000 A

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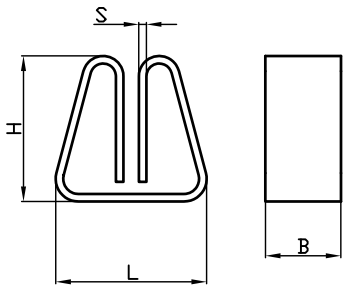
Small Contacts

Material: Brass or E-Copper

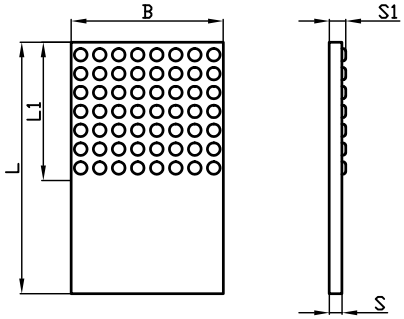


Part No.	For contact bar	Dimensions mm L	B	H	S	Material	Weight kg/piece
51330	25 x 4	21	23	43	2	MS	0,06
51335	40 x 5	38	38	67	3	MS	0,25
51340	50 x 5	64	40	67	5	E-Cu	0,50
51345	60 x 5	92	50	95	5	E-Cu	0,55
51350	80 x 5	92	50	115	5	E-Cu	1,60
51355	50 x 10	100	40	80	10	E-Cu	1,70
51360	60 x 10	100	50	95	10	E-Cu	1,80
51365	80 x 10	100	60	125	10	E-Cu	3,00
51370	100 x 10	100	60	145	10	E-Cu	3,50

Note: Cold formed version without connection holes. If desired, versions are available with drill holes or with finished surfaces.

Stamped Contact Plates

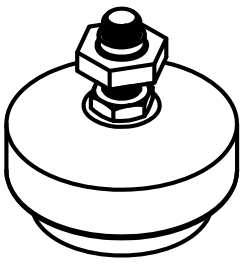
Material: E-Copper

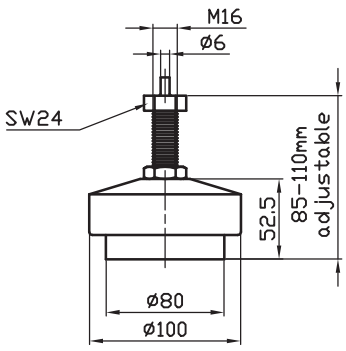


Part No.	Dimensions mm L	L_1	B	S	approx. S_1	Weight kg/piece
17500	250	150	100	5	7	1,10
17505	250	250	100	5	7	1,10
17520	175	100	100	10	13	1,60
17525	235	150	100	10	13	2,10
17526	185	90	100	10	13	1,65

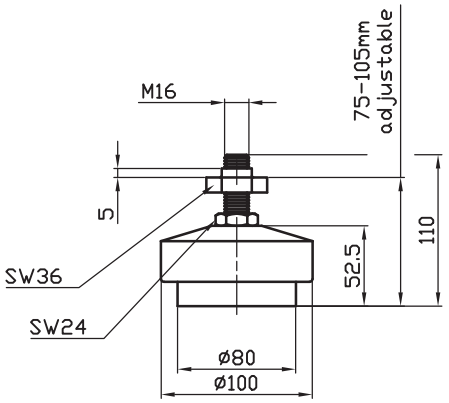
Note: Stamp formed contact plates suitable for solder or screw contact.
These are for improving the current transfer by increasing the size of the contact area.

Insulated Feet for Tanks





Part No. 15640



Part No. 15641

Part No.	Setting height mm	Insert/ thread	SW	Weight kg/piece
15640	85-110	Ø 6	24	0,80
15641	75-105	M16	36	0,95

Note: The height of these feet can be set using steel armatures. They are suitable for tanks in the galvanising industry. They are made of a special pressed material. Bending resistance: 700 kp/cm², Load resistance up to 20 t.

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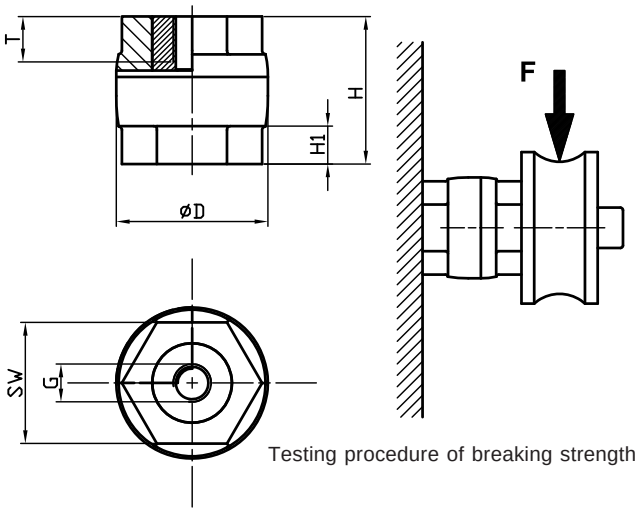
Insulators – Doubled Hexagonal Design

With threaded steel inserts (9S 20 K zinc coated)

The supports described here are made of a fibreglass reinforced unsaturated polyester resin. The special characteristic is a doubled hexagonal design. So a hexagonal area is fixed at the top as well as at the bottom of the insulator. Therefore it is quick and easy to install or remove the insulators even in confined spaces. This keeps installation costs down to a minimum.



Testing procedure of breaking strength

Part No.	Dimensions mm D	H	G	SW	T	H1	PS kV	BWS kV	F kN	Z kN	Weight kg/100 Pieces
03068 S	30	30	M 6	24	8	9,5	5	0,75	3	6	5,70
03069 S	30	30	M 8	24	8	9,5	5	0,75	3	6	5,40
03070 S	30	40	M 6	24	10	10	5	1,00	4	8	7,30
03071 S	35	30	M 6	30	8	10	5	0,75	4	7	6,50
03072 S	35	30	M 8	30	8	10	5	0,75	5	8	6,10
03073 S	40	40	M 8	32	12	10,5	5	1,00	6	11	13,00
03074 S	40	40	M10	32	11	10,5	5	1,00	6	11	12,10
03075 S	40	40	M12	32	10	10,5	5	1,00	6	11	11,20
03080 S	40	50	M 8	32	12	10,5	10	1,50	5	11	16,50
13080 S	40	50	M10	32	15	10,5	10	1,50	5	11	16,50
03081 S	40	50	M12	32	13	10,5	10	1,50	7	11	13,80
13081 S	40	60	M 8	32	12	11	10	1,50	4	11	16,90
13082 S	40	60	M10	32	15	11	10	1,50	4	11	17,60
03078 S	50	40	M10	41	11	13	5	1,00	8	13	16,50
03079 S	50	40	M12	41	10	13	5	1,00	10	13	16,50
13083 S	50	50	M12	41	13	13,5	10	1,50	8	13	20,00
03084 S	50	60	M10	41	15	13,5	10	1,50	6	13	24,10
03085 S	50	60	M12	41	18	13,5	10	1,50	7	13	24,70
13084 S	60	60	M12	50	18	18,5	10	1,50	9	15	32,30
13085 S	60	60	M16	50	17	18,5	10	1,50	12	17	32,80

F = Rated load limit on upper support edge
Z = Breaking load for tensile load
PS = Test voltage
BWS= Max. operational alternating stress

Technical Data of the material

Density	DIN 53479	1.75 g/m³
Flexural Resistance	DIN 53452/ISO R 178	120 N/mm²
Impact Resistance	DIN 53453/ISO R 179	50 kJ/m²
Impact Value	DIN 53453/ISO R 179	45 kJ/m²
Long Term/ Operational Temperature	VDE 0304 Part 21	+ 130°C
Rod Behaviour	DIN 53459-A/ISO R 181	Level 2a
Behaviour in a fire	UL 94	Class V-0
Surface Resistance	DIN 53482	$10^{13}\ \Omega$
Special Throughput Resistance	DIN 53482	$10^{14}\ \Omega$. cm
Dielectric Loss Factor	DIN 53483	< 0.02 tan /50 Hz
Deposit Tracking	DIN IEC 112/VDE 0303 Part 1	CTJ 600
Water Absorption	DIN 53495	< 50 mg/ 1 d
Colour	-	Brown / RAL 8016

The values in the table have been determined with our own standards based on DIN 53451 and combined with the standards for the respective materials for test purposes.

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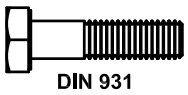
Hexagon Headed Bolts DIN 931/DIN 933

Material: Stainless Steel A2



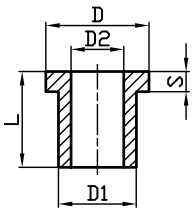
DIN 931

DIN 933

Bolt length mm	Part No. for bolts M5	M6	M8	M10	M12	M16	M20
30	**53101**	**53140**	-	-	-	-	-
35	**53102**	**53141**	**53180**	-	-	-	-
40	**53103**	**53142**	**53181**	**53220**	-	-	-
45	**53104**	**53143**	**53182**	**53221**	**53260**	-	-
50	**53105**	**53144**	**53183**	**53222**	**53261**	-	-
55	-	**53145**	**53184**	**53223**	**53262**	**53301**	-
60	-	**53146**	**53185**	**53224**	**53263**	**53302**	-
65	-	-	**53186**	**53225**	**53264**	**53303**	**53341**
70	-	-	**53187**	**53226**	**53265**	**53304**	**53342**
80	-	-	**53188**	**53227**	**53266**	**53305**	**53343**
90	-	-	**53189**	**53228**	**53267**	**53306**	**53344**
100	-	-	**53190**	**53229**	**53268**	**53307**	**53345**
110	-	-	-	-	**53269**	**53308**	**53346**
120	-	-	-	-	**53270**	**53309**	**53347**

Note: When ordering, please indicate the desired DIN. If a version is desired in A4 stainless steel, please indicate A4 in the order.

Insulated Inserts made of Epoxy Glass Hard Resin

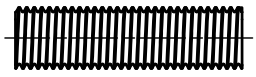


Part No.	Suitable for bolt	Dimensions mm L	D	D_1	D_2	S
53450	M 8	32	20	14	9	4
53455	M10	32	23	16	11	4
53460	M12	34	25	18	13	6
53465	M16	34	32	22	17	6
53470	M20	38	38	27	21	8

Note: These inserts are used for insulating fastening bolts from the tank, e.g. for contact block fastening. The material Epoxy Glass Hard Resin is well suited for its temperature resistance as well as its ability to handle extreme pressure and is very good for use in galvanising equipment.

Threaded Rods

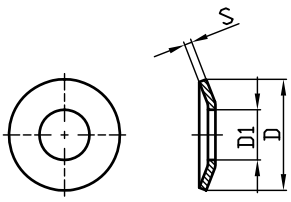
Material: Stainless Steel A2/A4 or Brass



Part No. Material: A2	Part No. Material: A4	Part No. Material brass	Thread	Rod length
17980	**18030**	**18080**	M 3	1 m
17985	**18035**	**18085**	M 4	1 m
17990	**18040**	**18090**	M 5	1 m
17995	**18045**	**18095**	M 6	1 m
18005	**18055**	**18105**	M10	1 m
18010	**18060**	**18110**	M12	1 m
18015	**18065**	**18115**	M16	1 m
18020	**18070**	**18120**	M20	1 m

Friction Washers DIN 6796

Material:
Spring Steel / Zinc Coated + Chromed



Part No.	For bolt	D	Dimensions mm D_1	S	Package unit pieces
18350	M 3	3,2	7	0,5	1000
18355	M 4	4,3	9	0,8	1000
18360	M 5	5,3	11	1	1000
18365	M 6	6,4	14	1,2	1000
18370	M 8	8,4	18	2	500
18375	M10	10,5	23	2	100
18380	M12	13	29	2,5	100
18390	M16	17	39	3,5	100
18395	M20	21	52	5,5	100

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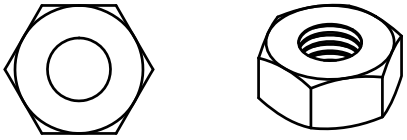
Hexagon Nuts DIN 934
Material: Stainless Steel A2

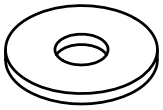


Part No.	Weight	Packaging Units Pieces
18150	M 3	500
18155	M 4	500
18160	M 5	500
18165	M 6	100
18170	M 8	100
18175	M10	100
18180	M12	100
18185	M16	100
18190	M20	100

Notes: If desired, also available in A4 stainless steel.

Lock Washers
Material: Stainless Steel A2

DIN 125



DIN 9021

Part No. DIN 125	Part No. DIN 9021	For bolt	Outside Ø DIN 125	DIN 9021	Pack. Unit Pieces
18200	**18241**	M 3	7	9	500
18205	**18242**	M 4	9	12	500
18210	**18243**	M 5	10	15	500
18215	**18244**	M 6	12,5	18	500
18220	**18245**	M 8	17	25	500
18225	**18246**	M10	21	30	100
18230	**18247**	M12	24	40	100
18235	**18248**	M16	30	50	100
18240	**18249**	M20	37	60	100

Note: If desired, also available in A4 stainless steel.

Spring Washers DIN 127 B
Material: Stainless Steel A2

Part No.	For bolt	Centre Ø mm	Packaging Unit Pieces
18250	M 3	3,1	500
18255	M 4	4,1	500
18260	M 5	5,1	500
18265	M 6	6,1	500
18270	M 8	8,2	100
18275	M10	10,2	100
18280	M12	12,2	100
18225	M16	16,2	100
18290	M20	20,2	100

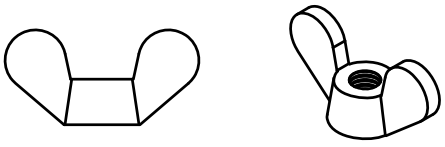
Note: If desired, also available in A4 stainless steel.

Spring Washers DIN 6798
Material: Bronze

Part No.	For bolt	Centre Ø mm	Packaging Unit Pieces
18300	M 3	3,2	500
18305	M 4	4,3	500
18310	M 5	5,3	500
18315	M 6	6,4	500
18320	M 8	8,4	500
18325	M10	10,5	100
18330	M12	12,5	100
18335	M16	18,5	100

Note: If desired, also available in stainless steel.

Wing Nuts DIN 315 and American Format
Material: Stainless Steel A2



Part No. DIN 315	Part No. Americ. Format	Thread	Wing Ø mm DIN 315	Wing Ø mm Americ. format
-	**17870**	M 3	-	18
17835	**17875**	M 4	18	18
17840	**17880**	M 5	24	23
17845	**17885**	M 6	30	28
17850	**17890**	M 8	36	30
17855	**17895**	M10	48	36
17860	**17900**	M12	62	49
17865	**17905**	M16	70	58

Note: American format wing nuts = lighter version cold pressed. If desired, also available in A4 stainless steel.

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Hard Rubber Repair Kit

Part No.	Description	Contents/Container
30713	Hard rubber kit paste	0,57 kg Can
30714	Hardener	0,43 kg Can

Note: Hard rubber repair kit based on epoxy mortar. Especially suitable e.g. repairing rubberised tank inner wall in galvanising equipment or as tubing protection. Use of this repair kit depending on chemical and thermal conditions. The hard rubber repair kit has excellent adhesive properties when used with various bases such as steel and hard rubber. The material stands up well with inorganic, non-oxidising acids, lye and salt chemicals. The hard rubber repair kit consists of two component material which are mixed 1:1, spread on the base and spread smooth.

Cold Insulating Compound Plastistal

Part No.	Description	Contents/Container
30710	Plastistal	8 kg Bucket
30711	Hardener	2 kg Can

Note: This material is suitable for coating and for small repairs on plating racks or for plastic insulation repairs. Plastistal is a two component material which can be spread on the base surface. This compound is mixed at 4:1 and requires 24 hours to harden.

Contact- and Heating Grease

Part No.	Description	Contents/Container	Description
02770	Contact grease for copper	865 g Can	High copper content contact grease with high melting point (+80°C). Ensures good conductivity and prevents corrosion and contamination of contact surfaces. Especially suitable for contact blocks, current bars and bus-bars.
02771		9 kg Bucket	
02772	Contact grease for aluminium	865 g Can	Same properties as above 02770/71, but with aluminium. Suitable for bus-bars and aluminium contacts. Prevents oxide deposits.
02773		9 kg Bucket	
17615	Quartzose contact grease for copper and aluminium	865 g Can	Quartzose contact grease with high heat resistance and good conductivity. Range of application: -20° to +200°C, Melting point +260°C. Resistant to water and humidity. Quartz properties destroy any insulating oxide or paint layers. Good protection against corrosion.
17620		9 kg Bucket	
17630	Non-quartzose contact grease for copper and aluminium	865 g Can	Contact and heat conducting with no quartz. Range of application -20° to +200°C. Melting point +260°C. Suitable for use as protection against corrosion and as a lubricating substance. This can also be used in high temperature conditions such as with collectors, rectifiers, heating cabinets as well as for current bars in switching stations.
17635		9 kg Bucket	

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Part No.	Description	Contents	Description	Application
Cleaning Sprays				
02776 **11260**	Contaclean Spray	200 ml 400 ml	Eliminates oxide and sulphide build-up on metal contact surfaces of all types and builds a long lasting lubrication and corrosion protection.	This spray is suitable for cleaning and maintaining metals in the electronic branch, e.g. switches, relays, contacts and current bars.
02778 **11262**	Wash Spray	200 ml 400 ml	Removes contamination and grease as well as e.g. oxide layers produced by Contaclean. Good wash and flow properties allow contamination to be simply rinsed away.	Intensive cleaning of contacts, devices and components in the electronic branch. E.g. switches, electric motors, relays, contactors, housings, contacts and current bars.
02787 **11264**	Grease removal Spray	200 ml 400 ml	A quick and sure way of removing grease and oil, wax and other contamination. Guaranteed water and humidity displacement.	Grease removal from devices, equipment and components, especially for electric motors, high voltage switches, current bars, cables, switches and signal systems. Displaces water and humidity even in places that are hard to reach.
Protection and Lubrication				
02788	Top-PIN Spray	200 ml	Protective and lubricating sprays for ensuring the functionality of cable joins, adapters and is especially suitable for precious metals. It offers good lubrication and protection against corrosion because of its synthetic properties. The film that this spray leaves has very good gliding qualities and is thin and withstands heat up to +300°C.	For maintaining the functionality of plug contacts of all types over very long periods. Especially for high quality electronic devices and for use in aggressive conditions.
02779 **11266**	Silicone Spray	200 ml 400 ml	High quality, thick insulating oil with a dielectric strength of 12 kV/mm. It will not dry out, is water repellent and is therefore suitable for use as a humidity buffer. It with stands temperatures from -50°C to +200°C. The material is not poisonous and is a good allround lubricant.	For the prevention of arcing in high voltage transformers, tube caps, etc. This spray stops current leakage and the corona affect. It prevents sparking on spools and windings of any type. This can be used as a lubricant, e.g. for pulling cables or as a parting compound for plastic production.
11268	Lubrication Spray	200 ml	Fat free lubricating and parting compound based on PTFE. It offers a low friction coefficient, is anti-adhesive with adhesive materials and can be used on all materials. It is stable when used with chemicals and is electrically insulated. Can be used in temperatures from -100°C to +260°C.	Especially suitable for use in electronic branch as lubrication for working with wires or as a dry film lubricant for electromechanical components. This product is also a good parting compound when processing plastics. It can be used anywhere that an oil free surface should exist.
11261	Anti-corrosion Spray	400 ml	Penetrates dampness, displaces water and protects from corrosion even under the toughest environmental conditions. This material infiltrates the finest pores and cracks. The film left behind is practically invisible and normally must never be removed (painting is the exception).	Corrosion protection for stamped, machined and cut metal parts made of steel, alloyed steel, aluminium, nonferrous heavy metal, etc. For protecting partial products, replacement parts, bearings, sprocket gears, shafts, etc. Also suitable for greasing hinges, locks as well as for maintaining tools, drills and fastening devices.
Lacquer				
02780 **11265**	Plastic Spray	200 ml 400 ml	High quality acrylic resin transparent lacquer for insulating and sealing. This covers surfaces with a glossy surface which resists acid, lye, alcohol, humidity and environmentally harmful elements. This material bonds to metal, plastic, wood, paper, glass, etc. It can be used under temperatures between -70°C and +120°C.	Insulation for circuit boards, components, wires, cables, etc. It prevents current leakage, the corona affect, short circuits and sparking. This material builds a seal stopping water, contamination and humidity. It offers protection against corrosion for items that are subject to elements that are harmful to the environment. This substance can also be used for sealing paper, wood, leather, etc.
02774	Isotemp Spray	200 ml	Especially heat-, humidity and weather resistant silicone insulation lacquer. It is functional even in temperatures up to +500°C. This material is hard to burn (UL 94), has good bonding properties and is resilient. It links well at room temperature and is quick functioning.	Insulation for circuit boards, seals system housings, etc. It is especially suitable for components that must withstand high temperatures.

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Load Capacity Table for Copper Wires and Copper Braiding

Rated cross section mm²	Load Amps	Rated cross section mm²	Load Amps	Rated cross section mm²	Load Amps	Rated cross section mm²	Load Amps
0,10	5	2,5	30	50	250	500	1100
0,14	6	4	40	70	300	625	1300
0,20	7	5,25	44	95	360	800	1500
0,25	9	6	55	120	420	1000	1800
0,35	10	8	70	150	480	1500	2200
0,50	12,5	10	85	185	570	2000	2400
0,75	15	16	120	240	670	3000	3000
1	18	25	150	300	780		
1,5	21	35	195	400	950		

Heat of 35° C Room temperature at 35° C to 70° C = maximum allowed temperature. Expansion joints made of Cu-Foil is welded and pressed versions can be loaded the same as normal current bars.

Load Capacity Table for Collector Bars of Copper DIN 43671 and Aluminium DIN 43670

Bar Dimensions mm	Cross section mm²	Continuous current – Amps Copper Plain	Copper Coated	Aluminium Plain	Aluminium Coated	Weight Copper kg/m	Weight Aluminium kg/m
12 x 2	24	108	123	80	100	0,209	0,063
15 x 2	30	128	148	95	125	0,262	0,079
15 x 3	45	162	187	134	154	0,396	0,120
20 x 2	40	162	189	120	165	0,351	0,107
20 x 3	60	204	237	168	196	0,529	0,161
20x 5	100	274	319	225	265	0,882	0,268
25 x 3	75	245	287	202	237	0,663	0,201
25 x 5	125	327	384	270	318	1,110	0,335
30 x 3	90	285	337	237	278	0,796	0,242
30 x 5	150	379	447	313	370	1,330	0,403
40 x 3	120	366	435	280	355	1,060	0,323
40 x 5	200	482	573	400	474	1,770	0,538
40 x10	400	715	850	595	705	3,550	1,080
50 x 5	250	583	697	485	577	2,220	0,673
50 x10	500	852	1020	705	850	4,440	1,350
60 x 5	300	688	826	566	680	2,660	0,808
60 x10	600	985	1180	820	990	5,330	1,620
80 x 5	400	885	1070	733	890	3,550	1,080
80 x10	800	1240	1500	1030	1270	7,110	2,160
100 x5	500	1080	1300	820	1080	4,440	1,350
100 x10	1000	1490	1810	1270	1540	8,890	2,700
120 x10	1200	1740	2110	1540	1870	10,700	3,240
160 x10	1600	2220	2700	1750	2300	14,200	4,320
200 x10	2000	2690	3290	2150	2850	17,800	5,400

One bar per conductor; Alternating current 60 Hz; Excess temperature 30° C, Air temperature 35° C; Interior space. Two parallel switching collector bars close together may not be loaded with double the amount of current, only with 1.7 times the current load for a single bar. See DIN 43670 and 43671.

Weights Table for current- and bus-bars made of copper

	Electrical Conductivity at 20° C $\frac{M}{ohm \times mm^2}$
E-copper spec. weight 8.9	57
Brass spec. weight 8.5	12 – 15
Aluminium spec. weight 2.7	36

Width mm	Thickness mm 2	3	4	5	6	8	10	15	20	25
10	0,180	0,270	0,360	0,450	0,540	0,720	0,890	-	-	-
12	0,220	0,320	0,430	0,540	0,540	0,860	1,070	-	-	-
14	0,250	0,380	0,500	0,630	0,750	1,000	1,250	-	-	-
15	0,270	0,400	0,540	0,670	0,810	1,070	1,340	2,020	-	-
20	0,360	0,540	0,720	0,890	1,070	1,430	1,780	2,700	3,600	-
25	0,450	0,670	0,890	1,120	1,340	1,780	2,230	3,370	4,500	5,560
30	0,540	0,800	1,070	1,330	1,610	2,140	2,670	4,050	5,400	6,700
35	0,630	0,930	1,250	1,560	1,870	2,500	3,120	4,720	6,300	7,850
40	0,710	1,070	1,430	1,780	2,140	2,850	3,560	5,400	7,200	8,960
45	0,800	1,200	1,610	2,000	2,410	3,210	4,000	6,080	8,100	10,090
50	0,890	1,340	1,780	2,220	2,670	3,560	4,450	6,750	9,000	11,200
60	1,070	1,600	2,140	2,670	3,210	4,280	5,340	8,100	10,800	13,500
70	1,250	1,870	2,500	3,110	3,740	4,980	6,230	9,450	12,600	15,700
80	1,430	2,140	2,850	3,560	4,280	5,690	7,120	10,800	14,400	17,920
90	1,600	2,410	3,210	4,000	4,810	6,400	8,010	12,150	16,200	20,160
100	1,780	2,670	3,560	4,450	5,340	7,190	8,900	13,500	18,000	22,300
110	1,960	2,940	3,920	4,900	5,880	7,840	9,800	14,850	19,800	24,640
120	2,130	3,200	4,270	5,240	6,400	8,550	10,680	16,200	21,600	26,900
130	2,310	3,490	4,630	5,780	6,940	9,250	11,570	17,550	23,400	29,920
140	2,490	3,740	4,980	6,220	7,470	9,960	12,460	18,900	25,200	31,360
150	2,670	4,000	5,340	6,670	8,010	10,460	13,350	20,250	27,000	33,600
160	2,850	4,270	5,700	7,120	8,550	11,740	14,400	21,600	28,800	35,800
200	3,560	5,240	7,120	8,900	10,640	14,380	17,800	27,000	36,000	44,800

Weight per meter in kg.

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