

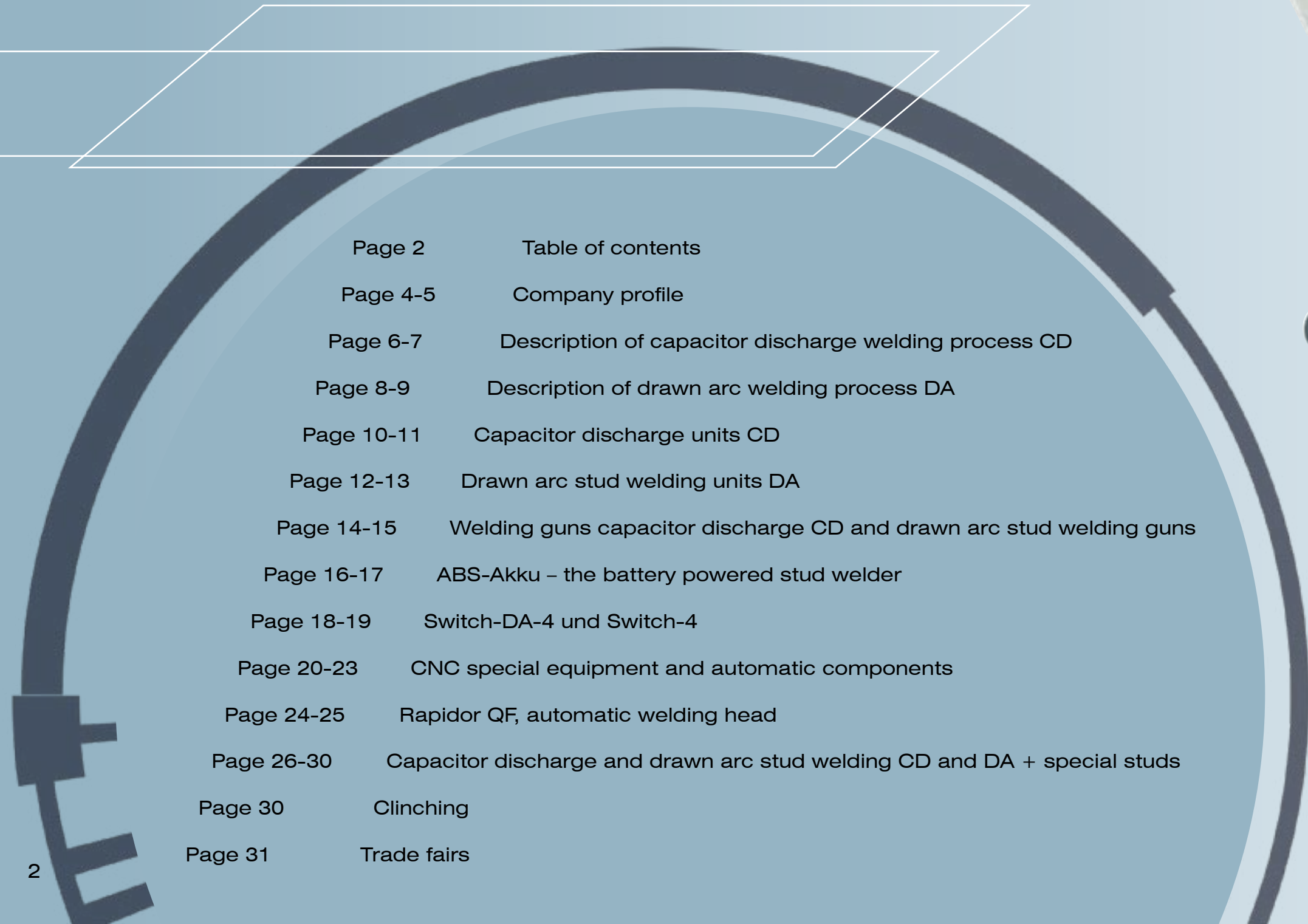


**Bolzenschweißtechnik**  
bsk + BTV GmbH

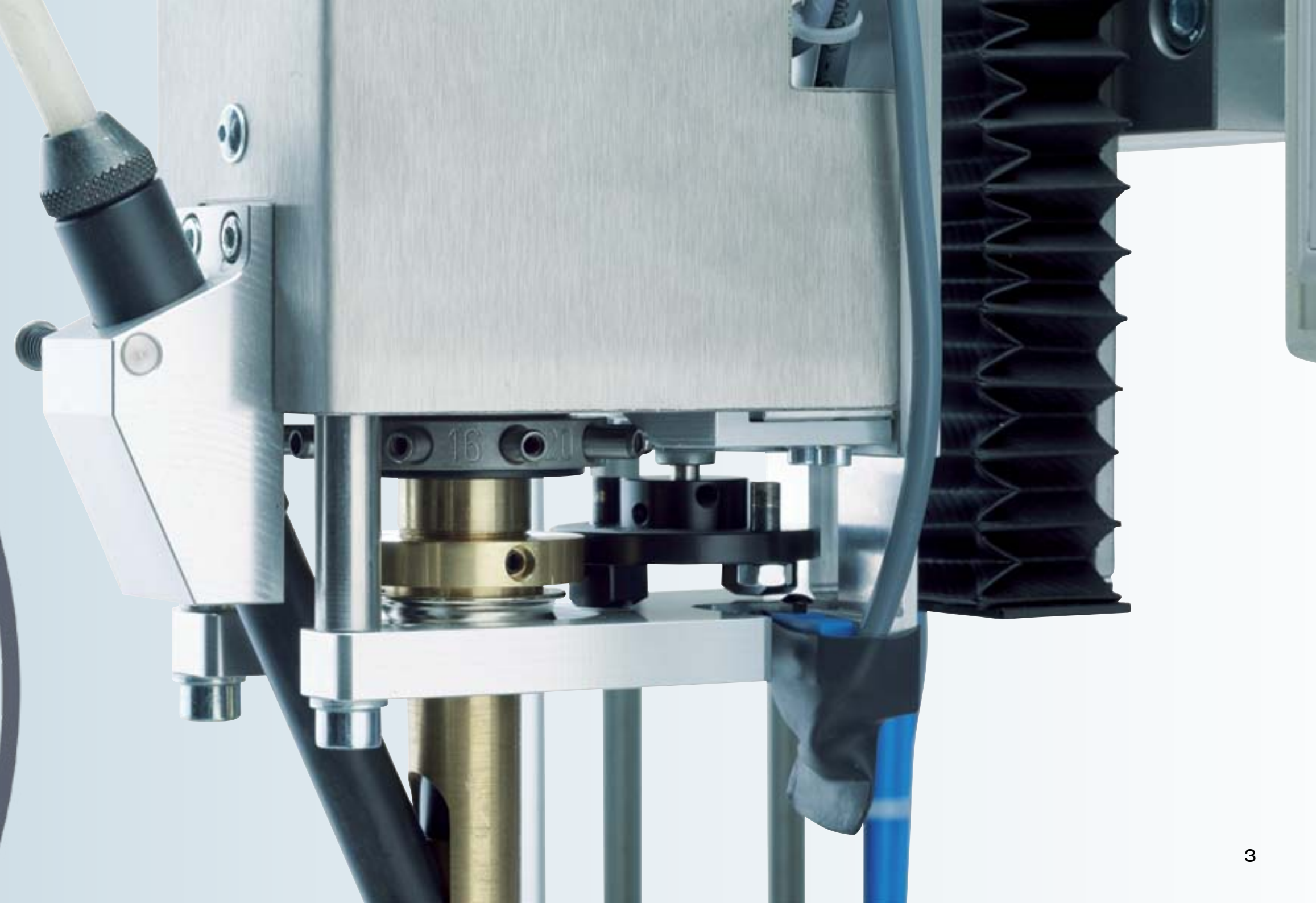


# Generation M

V e r s i o n 2 . 2



Page 2	Table of contents
Page 4-5	Company profile
Page 6-7	Description of capacitor discharge welding process CD
Page 8-9	Description of drawn arc welding process DA
Page 10-11	Capacitor discharge units CD
Page 12-13	Drawn arc stud welding units DA
Page 14-15	Welding guns capacitor discharge CD and drawn arc stud welding guns
Page 16-17	ABS-Akku – the battery powered stud welder
Page 18-19	Switch-DA-4 und Switch-4
Page 20-23	CNC special equipment and automatic components
Page 24-25	Rapidor QF, automatic welding head
Page 26-30	Capacitor discharge and drawn arc stud welding CD and DA + special studs
Page 30	Clinching
Page 31	Trade fairs





**We are vigilant, brave, experienced and frank.**

The most important characteristics for us are a sympathetic ear for our customers, enjoyment of new challenges and a high level of quality consciousness. With a dynamic team of practically experienced engineers, technicians and business experts, we offer you tailor-made solutions. You too can benefit from our competence in the fields of project planning, implementation and service.

# Company philosophy

**We have the vision.**

Decades of experience in the construction of CNC stud welding equipment and special machines means we do not shy away from even the most complex tasks. In a personal meeting we address your requirements and expectations, search for the best solution and we will be a reliable partner during implementation. Our communication is binding.

**We offer experience and quality.**

Our portfolio covers the complete range of stud welding technology: compact hand stud welding units, equipment technology, components for semi and fully automatic applications, CNC and special equipment as well as welding elements in almost all dimensions. Along with the production and distribution of individual components, we also offer you tailor-made, individual system solutions.

Or do you prefer clinching? Just ask us! Our warehouse also contains a large range of high-quality press-in elements. We will be happy to provide you with tailor-made special components.

**We use modern and clever solutions - even if we have to invent them ourselves.**

An innovative development department with a modern equipment production line, the production of CNC machines with standard workbench dimensions of 800 x 500 mm and large format workbenches of 3000 mm x 1500 mm along with special machines have continuously extended our range of products.

One example of our own enthusiasm and our claim to exceed our customers' expectations, is the latest development at Bolzenschweißtechnik bsk+BTV GmbH: the automatic welding head RAPIDOR QF with its patented fully automatic stud length adjustment system for all stud lengths. This revolution makes it possible to work even more economically and efficiently.

**After-sales service. We continue to support you after your order has been processed.**

Customer care and uncomplicated service are our strong points – this is what we are known for. Along with maintenance and repairs, our range of services includes calibration and safety technology-related tests in accordance with the relevant regulations and guidelines.

The management system based on DIN EN ISO 9001 ensures that the products are of a consistently high quality and that competent service is provided from order acceptance to dispatch.





The capacitor discharge stud welding process with tip ignition serves for welding mainly pencil-shaped metal parts from about 1 to 10 mm in diameter to thin sheets from 0.5 to about 3 mm. Distinction is made between two processes: contact welding and gap welding.

# Description of capacitor discharge welding process CD

## The contact welding process

The contact welding process is preferred for high-grade steel and unalloyed and zinc coated sheets ( $\sim 15\mu$ ) where the welding stud is fed to the chuck and applied to the workpiece with a hand-held gun or automatic stud welding head. A compression spring in the welding gun presses the stud with welding tip as typically used in capacitor discharge stud welding against the workpiece. When the trigger of the welding gun is squeezed, the energy stored in the capacitors is discharged via a thyristor. The ignition tip of the stud is heated to the extent that it suddenly melts and partially evaporates. The arc occurring in the process completely melts the end of the stud and workpiece.

After a welding time of only 1-3 ms and up to 15,000A, the studs and base metal are homogenously joined with only a very small fusion zone of a few tenths of a millimetre. This enables studs to be welded to very thin sheets without disturbing marks or discoloration being produced on the back.



## The gap welding process

The gap welding process differs from the contact welding process in that the stud is lifted to a preset distance or gap after squeezing the trigger and pushed against the workpiece by the force of a spring. When the ignition tip of the stud touches the workpiece, the arc is ignited. The arc duration or welding time can be varied by adjusting the gap; this is generally shorter than in the contact welding process however. The gap welding process is therefore preferred for materials with a low melting point such as aluminium or brass. The welding time is maximum 1.5ms and the fusion zone is again smaller than in the contact welding process. The workpiece surface must be clean and free of electrodeposited coatings, oil, rust or scale.



The drawn arc welding process with tip ignition serves for welding mainly pencil-shaped metal parts from 3 to 30 mm in diameter to metal workpieces from a thickness of 0.8 mm upwards. Distinction is made between two processes: short cycle drawn arc welding and drawn arc welding with ceramic ferrule or shielding gas.

## Description of drawn arc welding process DA

### Short cycle drawn arc

The short cycle drawn arc process is preferred for welding flange studs from 4 to 10 mm in diameter to thin sheets also with electrodeposited coatings below  $30\mu$ .

The main area of application is the automotive industry with up to 600 studs per shell where the stud is fed to the chuck of the welding gun or automatic stud welding head and the gun is supported on the workpiece with a positioning tube, stop pin or gas attachment. After squeezing the trigger, the stud is lifted from the workpiece by means of a lifting magnet in the gun and a pilot arc ignited. The main current is subsequently applied via a transformer and thyristor bridge.

The arc completely melts the end of the stud and workpiece surface, whereupon the lifting magnet is deenergised after lapse of a preset welding time and a spring pushes the stud into the molten weld pool. After a welding time of 5 to 100 ms and 500 to 1500 A, depending on the particular application and stud diameter, the stud and base metal are homogeneously joined and have a small fusion zone of about 1/8th of the stud diameter. In contrast to the capacitor discharge welding process, no loud bang is produced here and the process reliability is higher due to the welding time which is about 10 times longer.

## The drawn arc welding process with ceramic ferrule

For the drawn arc welding process with ceramic ferrule, a ceramic ferrule is used as weld pool protection, which serves for forming the weld pool, stabilising the arc, shielding the atmosphere and protecting the welder against UV radiation. The ceramic ferrule is used only for a single weld and is removed after solidification of the weld pool by knocking off the stud. This process is used mainly in structural steel and mechanical engineering applications where threaded studs or shear connectors from 6 to 25 mm in diameter are welded to thick steel plates or supports larger than 1/4 of the stud diameter with welding times from 100-1.000 ms and 800-2.600 A.

### Shielding gas

Both processes can be extended with shielding gas or shielding gas can be used to replace the ceramic ferrule, which considerably reduces pore formation in the weld pool and produces a more homogeneous fillet type welding bead.

Used as a shielding gas is a mixture of 82% argon and 18% CO<sub>2</sub>, which is supplied to the welding gun via a suitable shielding gas attachment. With welding times from 5 to 300 ms and currents from 500 to 1500 A, studs from 3 to 12 mm in diameter can be welded to clean sheets of minimum 1/8th of the stud diameter. The welding of aluminium materials by the drawn arc process is possible only to a limited extent.





# Capacitor discharge stud welding units CD

Upgrade with new design, now electronic and mechanical monitoring possible: Our proven capacitor discharge devices are now available in versions CDP-66M, CDP-99M and CDP-133M with advanced features: Digital position measuring system (stud overlap, lift, depth of immersion, speed) and digital process control with monitoring of the welding current and the energy content, and many other library functions for permanently stored or variable stored welding parameters, incl. optional multi-site operation. This new innovative generation of devices represents a modern microprocessor control, one-button operation, powerful inverter charging entirety and generous 4-inch graphic display the latest technology. Diameter of 3 mm to 10 mm can be welded in safety process.

The multipoint technologique (Switchbox 4-CD) allows the connection of up to four welding guns for different studs. The users can weld in only one operation-cycle; it can be increases the productivity significantly.

Simple dialog operator guidance: all the important parameters are monitored an can be adjusted. The integrated bargraph indicates the optimal settings for each stud diameter, thus not only increasing operating convenience, but also the reliability of the process considerably; additionally the welding curcuit is electronically monitored. Error codes and software technical extension options and submenus support the user regarding high serviceability. The thermostatic controlled cooling system always guarantees high welding sequences and extremely short charging times, especially for heavy-duty and automation applications. Monitoring of loading voltage and capacity are state of the art.



## CDP-66M

### DATA

66.000  $\mu$ F  
45–200 V charging voltage  
1 inverter charger  
position measuring system\*  
115/230 V  
50/60 Hz, 6 A  
460 x 200 x 265 mm W x L x H  
11,5 kg

Optional: digital process control system and multi-switch operation (for this we have a special „Switch-4“ in our range of products)

### APPLICATION

Sheet metal forming, isolation, control cabinet, kitchen cabinets, household appliances (white goods), hifi and computer technology and much more  
diameter ranges: carbon and stainless steel studs M3-M8  
zinc-coated metal sheets <15  $\mu$ m Aluminium-alloy max. stud M6

## CDP-99M

### DATA

99.000  $\mu$ F  
45–220 V charging voltage  
1 inverter charger  
position measuring system\*  
115/230 V  
50/60 Hz, 6 A  
460 x 200 x 265 mm W x L x H  
12,0 kg

### APPLICATION

Sheet metal forming, isolation, control cabinet, kitchen cabinets, household appliances (white goods), hifi an computer technology and much more  
**suitable for automation**  
diameter ranges: carbon and stainless steel studs M3-M10  
zinc-coated metal sheets <15  $\mu$ m / M8  
Aluminium-alloy max. stud M6

## CDP-133M

### DATA

132.000  $\mu$ F capacity selection  
45–200 V charging voltage  
1-3 inverter charger  
position measuring system\*  
115/230 V  
50/60 Hz, 16 A  
475 x 335 x 325 mm W x L x H  
16-18 kg

### APPLICATION

Sheet metal forming, isolation, control cabinet, kitchen cabinets, household appliances (white goods), hifi and computer technology and much more  
**suitable for automation**  
diameter ranges: carbon and steel studs M3-M10  
zinc-coated metal sheets <20  $\mu$ m up to M8  
Aluminium-alloy max. stud M6

### Connectable WELDING-GUNS

Overview on page 15: CONTACT, GAP, ATP-8 / with position measuring system: CONTACT-M, GAP-M, ATP-8M\*\*

### Connectable AUTOMATIC WELDING-HEADS

KAH-100D\*\*\*, Rapidor QF\*\*\*





Drawn arc stud welding units DA

Plug & Play – our innovations in the Hub – and short cycle  
The future has begun!

Our drawn arc stud welding machines are equipped with the latest microprocessor technology and very high effective power units. Our primary switched welding inverters DAI allows even the most complex welding task solved by welding diameter 25 mm reliably. Process control, digital position measuring system and the modular extension eg. the so-called “multi-switch technology” increase the process reliability, flexibility and application possibilities. Particularly with regard to process and lead times ensure pioneering technologies to the user, especially in mobile construction sites or fully automatic operation.

The DAI-1300 in this case forms the compact base unit; the inverter classes DAI-2300 and DAI-3300 also prove themselves by their robust design; the sophisticated cooling concept in the diameter ranges up to 22 mm and 25 mm guarantee high duty cycles and high reproducibility of the welding results. In the compact class is the unregulated DA-800M of proven DA-800 now available as a successor with a generous 4-inch display and even better comfort controls. It is one of the most powerful compact devices in its class and has been designed as an entry-level unit in the drawn-arc studwelding-technology particularly to ease out.

DA-800M    DAI-1300    DAI-2300    DAI-3300    DAI-1300S // DAI-2300S

DATA	DATA	DATA	DATA	DATA
Current unregulated 800A Welding time: 5-500 ms 8 studs per minute Power: 32A CEE / 3 x 400 V external multi-switch technology*3	digital current control Welding current: 1000 A Welding time: 5-600 ms duty cycle 10% Power: 32 A CEE / 3x400V digital process control system*2 external parallel connection up to 2000A / 3000A with 3 machines DAI-1300; external multi-switch technology*3 720x300x395 mm Weight: 30 kg	digital current control Welding current: 2000A Welding time: 5-1500 ms duty cycle 10% Power: 63A CEE / 3x400V digital process control system*2 external multi-switch technology*3 1.007x477,5x1.249 mm (LxWxH) Weight: 110 kg	digital current control Welding current: 3000 A Welding time: 5-1500 ms duty cycle 10% Power: 125 A CEE / 3x400V digital process control system*2 external multi-switch technology*3 1.007x477,5x1.249 mm (LxWxH) Weight: 134 kg	digital current control Welding current: 1000 A // 2000A Welding time: 5-600 ms // 5-1500 ms duty cycle 10% Power: 32 A / 3x400V // 63A CEE / 3x400V digital process control system*2 integrated multi-switch technology 1.007x477,5x1.249 mm (LxWxH) Weight: 80 kg // 115 kg
position measuring system *1				
APPLICATION	APPLICATION	APPLICATION	APPLICATION	APPLICATION
Steel construction, metalworking, shipbuilding, automotive, facade construction, power plant construction, bridge construction, container construction, mechanical engineering and many more // carbon and stainless steel and aluminum alloy sheet from metal thickness 0,8 mm				
studs / pins / threading bushings Ø 3 - 12 mm	studs / pins / threading bushings M3-M16 (RD), Ø 3-13 mm	studs / pins / threading bushings M3-M24 (RD), Ø 3-22 mm	studs / pins / threading bushings M3-M30 (RD), Ø 3-25 mm	studs / pins / threading bushings M3-M16 (RD), Ø 3-13 mm

Connectable WELDING-GUNS  
overview on page 15  
CONNECTABLE AUTOMATIC WELDING-HEADS  
ATP-8 and ATP-8M >> automatik module required  
KAH-100D and Rapidor QF >> CNC module required

\*1 Activated with guns with integrated position measuring system / overview welding guns on page 15  
\*2 Optional digital precc control system from inverter class DAI-1300 upward  
\*3 Optional multi-switch technology (for this we have a special „switch-box DA-4““ in our range of products)  
Dimensions are over all incl. connections

# Overview welding-guns

All welding-guns are optionally available with integrated position measuring system  
By capturing the way of the welding elements by measuring and recording of stud-overlap, lift, depth of immersion and speed, in conjunction with the digital process control system the process reliability can be increased.

The advantages are quite obvious  
We have a wide product range of manual welding guns for easy application at less flexible manufacturing with small numbers.

Due to the ergonomic shape of the guns they are very good in the hand and thus ensuring fatigue-free working.

The gun body is made of durable plastic, also for robust using.

We know our users and therefore we trysimple as possible to make.  
For this reason, in most gunsthere is no lift-adjustment necessary - we have a constant-lift for all common applications.

By using the length measuring system all parameterswill now be read and monitored on the display of control units. This also provides reproducible results, independent of the operator.

The large cable cross-sections also provide in continuous operation for lossless weldings.

Through our extensive range of accessories we have for every application the right thing. For bends, in templates, overhead welding positions or user-speci-fic special solutions.

Type	Contact/ Contact-M*1	GAP/ GAP-M*1	GAP-10M*1	DA-10/ DA-10M*1	GAP-12M*1	DA-12/ DA-12M*1	DA- 19M*1	DA-22M*1 / DA-25M*1	ATP-8*1 / ATP-8M*1and*2
Welding process	Contact procedu- re process CD	Capacitor discharge welding (gap process)	Short cycle (with or without shielding gas)		Drawn arc process with ceramic or gas			Drawn arc with ceramic ferrules	Drawn arc, short cycle, tip Ignition (gap process)
Area of application	Steel (alloyed and unalloyed)*2	Steel (alloyed and unalloyed) and not treatable aluminum alloys*3							
Welding area	M3 – M10 (Ø11 mm*3)	M3 – M10 (Ø11 mm*3)	M3 – M10 (Ø11 mm*3)	M3 – M10 (Ø11 mm*3)	M3 – 12 (Ø12 mm*3)	M3 – M12 (Ø12mm*3)	M8 – M20 (Ø16mm*3)	DA-22M: M8-M24 (Ø22mm*3) DA-25M: M8-M30 (Ø25mm*3)	M3 (Ø3 mm) – M8 (Ø8 mm*3)
Piston guide	Slide bearing guide	Linear ball guide					Double linear ball guide		Sleeve bearing guide
Way measuring system	*1: Way measurement system for measuring stud overlap, lift, depth of immersion and piston velocity								
Lift adjustment	. / .	1.0 - 4.0 mm, continuously adjustable via scale to welding gun		constant	1,0 - 4,0 mm, continuously adjustable via scale to wel- ding gun	constant	2,0-6 mm, in increments of 0,5mm (lift either via scale on welding gun and with connected position encoder additionally digitally readable at the inverter)		1,0 - 6,0 mm, continuously adjustable)
Spring force	Continuously adjustable	. / .							
Vertical alignment	Manual (without circular lever)						Circular lever (integrated in the end cap)		Manual (without circular lever)
Length compensa- tion	. / .		Ball carrier system						. / .
Immersion damping	. / .						Continuously adjustable (hydraulic damper)		. / .
Welding cable	6m, 25mm²	3m, 25mm²	5 m, 35mm²				5m, 50mm²	DA-22M: 5m, 95mm² *4 DA-25M: 5m, 120mm² *4	3m, 25mm²
Housing material	Reinforced thermoplastic								
Housing colour	grey						black		
Weight (without cable)	0,85 kg						2,10kg	2,7 kg	1,5 kg

\*1: Welding guns with integrated way measurement system  
\*2: Only in combination with integrated automatic module in machine series CDP-M and/or DAI  
\*3: Maximum welding-diameter (according standard DIN EN 13918); Material, group of material and class of mechanical strength of usable welding elements and allowed welding-joints of studs and ground material see DVS-roule 0902 “Drawn arc stud welding”, DVS roule 0903 “capacitor discharge stud welding” and DVS-roule 0967 „Calculation of welding joints“  
\*4: Welding cable external



# ABS-Akku

ABS-Akku, the new compact and battery powered stud welder! The easy way to fix heating costs counters of panel radiators in mobile use

With the double welding technology two M3 studs can be attached simultaneously heating cost counters on panel radiators with integrated welding gun Contact ABS at the control unit ABS-Akku.

## Technical features

- Compact and robust housing, ideal for mobile use
- Simple and safe operation
- Integrated function monitoring in the welding circuit
- One single cable - so no additional ground cable required
- Integrated charging state control
- Automatic switch-off when not using the device
- Milliseconds fast welding of two studs metrics M3 simultaneously
- Retrofitting of calorimeters easily in existing housing-, business- and bathroom
- Highest mechanical safety against falling or slipping;
- Circular level integrated in the welding gun for the horizontal alignment integrated
- Exact and plane-parallel adjustment of the chucks for exact distance between the two studs to each other
- Gun holder and reel mechanism on the device
- Battery charger with integrated battery indicator
- Protection against harmful spatter on the welding gun



## ABS-Akku

### DATA

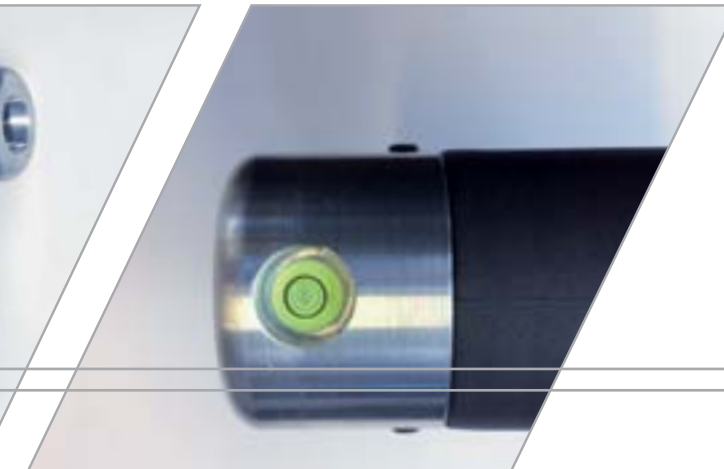
Capacity 80.000µF  
Charging with accumulator (12 V / 5 Ah)  
Welding rate > 200 double weldings metrics M3  
334 x 138 x 234 mm (length x width x high)  
Weight: 7,8 kg incl. welding gun Contact ABS

### APPLICATION

For fixing heating costs counters on panel radiators in mobile use

### WELDING GUNS

Contact ABS, contact gun for double weldings with pressure tripping





# Switchbox DA-4

Connection and operation of up to four stud welding guns with only one Inverter DAI: This works either with our separately available Switchbox DA-4 (separately available for DAI-1300, DAI-2300 and DAI-3300) or already integrated in the DAI-1300S or DAI-2300S. This is for the so-called multi-switch technology in the drawn-arc or short-cycle stud-welding processes and is designed for the use of up to four stud welding guns with only one inverter power unit (either DAI-1300, DA-2300, DAI-3300 or integrated, see above).

Due to the multi-switch technology welding elements of different dimensions (related to a component /product) can be welded without time-consuming changeover from one to the other diameter or length efficiently. It can increase the productivity significantly.

In the standard version, connection and operation with up to four drawn arc welding guns in any combination or sequence are possible. Generally, each output is equipped with a gas-module. Optionally, the combination of automatic guns ATP-8 / ATP-8M is with manual welding guns in any order possible (for automatic operation are at maximum configuration optionally up to four automatic modules available); as can up four fully automatic stud feed are connected.

The recognition of the particular gun course takes place either by START-triggering of the gun or contact recognition on the workpiece, which follows immediately switch to the respective channel position on Inverter.



A separate power supply is not necessary; this is done by means of an electronic bus connection between inverter and Switchbox DA-4.

All welding parameters are adjustable and available for each gun separately at the menu of the inverter. Here, the respective active gun Course (channel position) is displayed on the display of the inverter. The setting welding current, welding time and gas operation are possible by means of fixed and / or variable table.

Kanalposition (Std)					
✓	W	D	Strom	Zeit	
36	RD M8	700A	70ms		
37	RD M10	800A	160ms		
38	RD M12	700A	220ms		
39	RD M16	1000A	520ms		
40	PS M8	800A	35ms		
41	PS M8	700A	50ms		
START Zurück					

DAI-1300		
Std	699A	320ms 23,5V
Std	700A	320ms 14,0V
0		
2,5mm	2,0mm	1,0mm 125mm/s
12.03 15.07.2018		





# CNC special equipment and automatic components

## CNC portal coordinate table machine

With a particularly favourable price/performance ratio, our CNC portal coordinate table enables efficient operation also for small and medium-sized batches. With excellent quality and features, it opens up new dimensions in stud welding. Studs and no-thread studs from 3-12 mm diameter and 4-80 mm length can be welded using all stud welding processes.

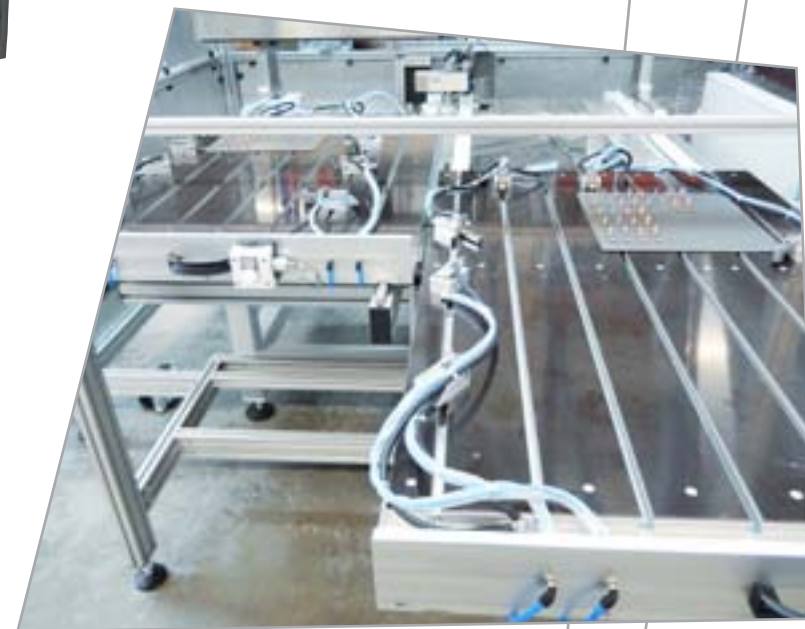
### WORK CAPACITY COORDINATE TABLE

- 800 x 500 mm
- 1000 x 1000 mm
- 1500 x 1000 mm
- 2000 x 1000 mm
- 2500 x 1250 mm
- 3000 x 1500 mm





## CNC special equipment and automatic components



### COORDINATE TABLE

- Sturdy machine frame of thick-walled welded steel sections
- Separate X and Y-axes for optimal axis loading
- Maintenance-free ball screw unit and linear guide with profile guide with integrated linear roller bearing and guide assembly
- Max. passage height 200 mm
- Driving via servomotors
- T-slot clamping plate with insulating coating
- Positioning accuracy +/- 0,2 mm
- Traversing speed up to 70 m/min
- Stud welding head 1-4: All welding heads on one z-axis mounted, thereby effort for driving as low as possible
- Height adjustment 40 mm
- Working stroke pneumatic 80 mm
- Monitoring of stud transport, welding current and charging voltage
- External power and emergency off switch
- Connection 400 V / 16 A
- Compressed air 6 bar
- Stud length monitoring system

Automatic welding gun ATP-8



Stud welding head with position measuring system for easy setting and monitoring of gap size and immersion depth



### PLC CONTROL SYSTEM

- Siemens Sinumeric 828D
- Programming directly on the PLC control system or at separate PC possible / DIN Programming
- Flexibility through variable zero points (as a complement to fixed zero points)
- loading voltage, stud length and welding current are stored in the program sentence via communication with our CDP/CDP-M - or DAI control units
- PLC control system and control units are protected against unauthorized Access via password

Fully automatic stud feeder BZ-V01



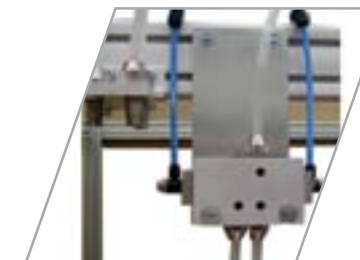
Pneumatical hand-slot



### OPTION

- Motorized z-axis 200 mm
- Digital process control system and documentable welding results
- Programming on extern workplace via dxf-file
- Remote maintenance
- Application of specific welding devices
- More options available

Stud selector





# RAPIDOR QF - Automatic Welding Head



We think in many dimensions - because where others stop, we are just beginning!  
The automatic welding head RAPIDOR QF with patented fully automatic length compensation system for all length of studs shows a new dimension of stud-welding.

The digital automatic welding head RAPIDOR QF is designed for semi - automatic and fully automatic stud welding elements to the following method (ISO 4063):

- >> capacitor discharge welding
- >> Short cycle and drawn arc

- Integrated digital stud-length measuring system
- Effective reduction of faulty welded final products, thereby clearly measurable increase in productivity;
  - Digital monitoring of the entire stud length for all stud welding processes for standard welding elements;
  - Monitoring and control of length of ignition pin (capacitor discharge welding);
  - Very simple and conspicuous posting of tolerance positions before and after welding in 0.1mm increments by a single reference welding element;
  - Reliable detection of not-okay weldings with plain text display on the primary control system with simultaneous program stop;



## Advantages

- >> Quickly set up by the proven digital display of lift and penetration
- >> No correction in the Z direction is required, because the stud protrudes always the same distance from chuck
- >> Programmatic pre-selection of different lengths in each set of the machine control program
- >> High durability and precision due to encapsulated, lying outside the weld area ball guide unit
- >> Quickly switch to the required bolt length, thus no long residence times
- >> Particularly suitable for rugged everyday use in CNC coordinate tables
- >> Manual adjustment for semi-automatic operation

## Technical Data

TYPE	RAPIDOR QF
Welding area	Bolts and pins Ø3 -12 mm and lengths from 6-30 mm*
Material / base material	Steel, stainless steel, aluminium and brass
Compressed air	5-7 bar, not oiled
Welding cycles	Depending on the welding process, diameter and power source (power unit), supply up to 30 studs per minute
Length compensation system	Semi- / fully automatic and programmatically
Automatic chuck/ guide jacket	Guarantees fast changeover to other stud diameters by using the proven components, no special parts required
Setting of lift and penetration	0-8 mm in steps of 0.25 mm per detent a stroke adjustment digital display
Dimensions (B x H x T)	65 x 440 x 90 mm
Weight	3,8 kg

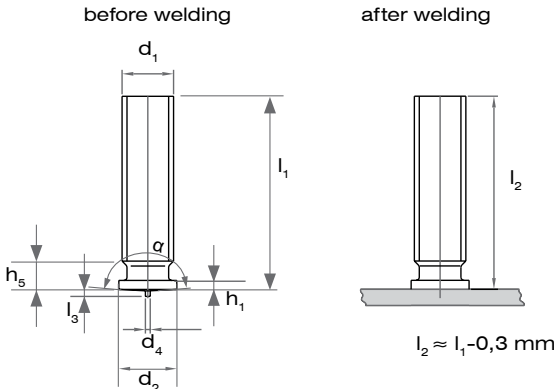
Fulfillment of the requirements of the Low Voltage Directive 2006/95/EC and EMC Directive 2004/108/EC as part of the declaration.



# Welding studs for capacitor discharge

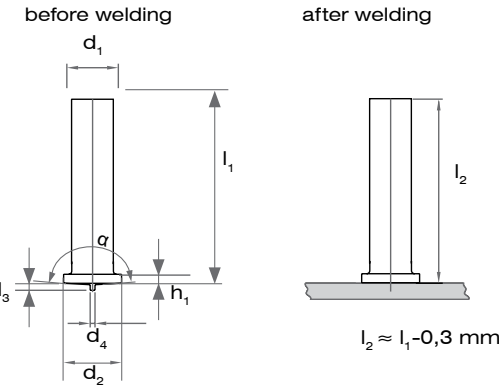
We supply at short notice threaded and no-thread studs, shear connectors and short cycle studs from our extensive stock and also manufacture special studs to suit your specific requirements in a high standard of quality.

## Threaded Studs PT



d <sub>1</sub>	l <sub>1</sub> +0,6	d <sub>2</sub> ± 0,6	d <sub>4</sub> ± 0,08	l <sub>3</sub> ± 0,05	max. h <sub>5</sub>	h <sub>1</sub>	α ± 2°
M3	6 8 10 12 16 20	4,5	0,60	0,55	0,6	0,7 bis 1,4	174 °
M4	8 10 12 16 20 25	5,5	0,65	0,55	0,6	0,7 bis 1,4	174 °
M5	10 12 16 20	6,5	0,75	0,80	1,0	0,7 bis 1,4	174 °
M6	20 25 30	7,5	0,75				
M8	12 16 20 25 30	9	0,75	0,85	1,5	0,8 bis 1,4	174 °

## Threaded Studs UT

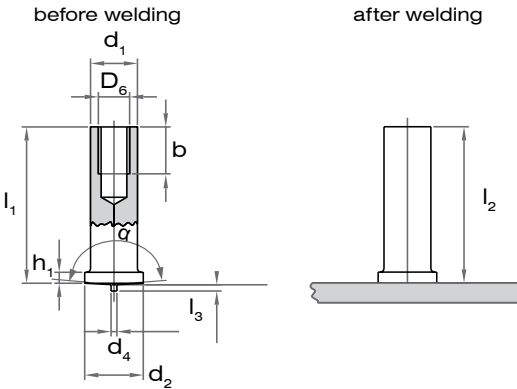


d <sub>1</sub> +0,1	l <sub>1min</sub> +0,6	d <sub>2</sub> ± 0,2	d <sub>4</sub> ± 0,08	l <sub>3</sub> ± 0,05	h <sub>1</sub>	α ± 2°
3	8	4,5	0,60	0,55	0,7 bis 1,4	174 °
4	8	5,5	0,65	0,55	0,7 bis 1,4	174 °
5	12	6,5	0,75	0,80	0,7 bis 1,4	174 °
6	12	7,5	0,75	0,80	0,7 bis 1,4	174 °
7,1	15	9	0,75	0,85	0,8 bis 1,4	174 °

Welding studs according to DIN EN ISO 13918 and special studs of copper plated steel, high-grade steel, brass or aluminium

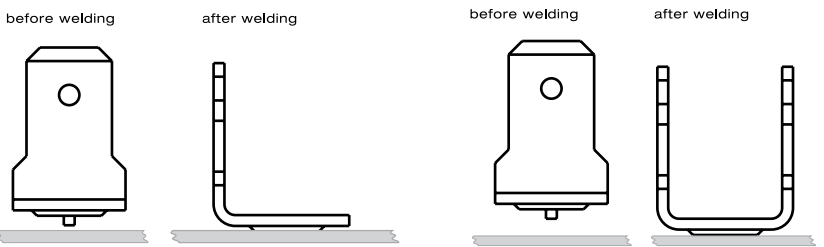
# Welding elements for capacitor discharge CD

## Tapped Studs IT



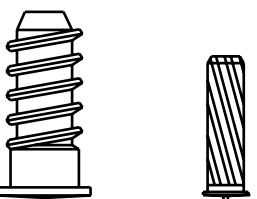
D <sub>6</sub>	l <sub>1min</sub> +0,6	b <sub>min</sub> +2P	d <sub>2</sub> ± 0,2	d <sub>1</sub> ± 0,1	d <sub>4</sub> ± 0,08	l <sub>3</sub> ± 0,05	h <sub>1</sub>	α ± 2°
M3	10	5	6,5	5,0	0,75	0,80	0,7 bis 1,4	174 °
M4	10	6	7,5	6,0	0,75	0,80	0,7 bis 1,4	174 °
M5	10	6	9	7,1	0,75	0,85	0,8 bis 1,4	174 °
M5	15	7,5	9	8,0	0,75	0,85	0,8 bis 1,4	174 °
M8	15	9	9	8,0	0,75	0,85	0,8 bis 1,4	174 °

## Flat grounding connector



Flat grounding connector 6.3 mm, single and double

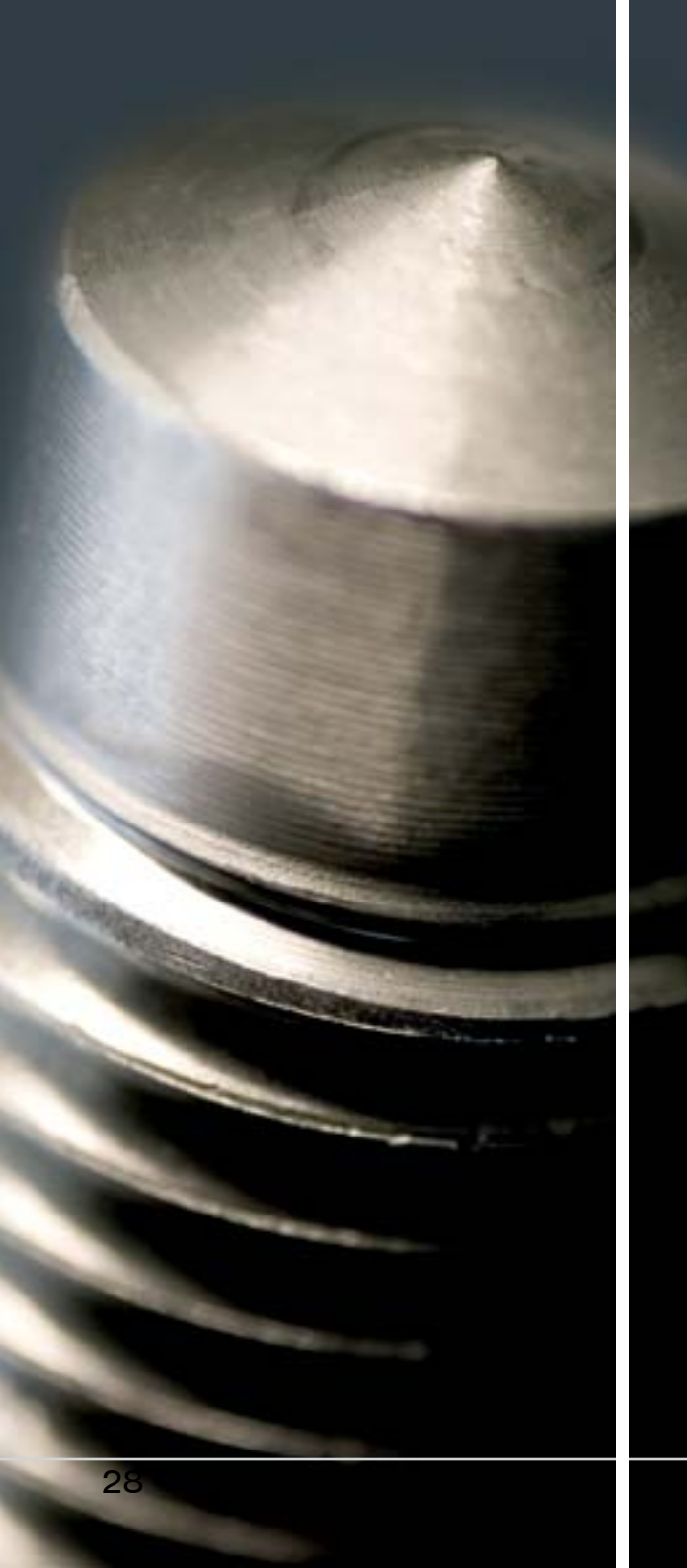
## Coarse threaded studs & Colour groove studs



Coarse threaded studs from 4 to 5mm in diameter and colour groove studs from M5 to M8 and lengths from 10 to 40 mm



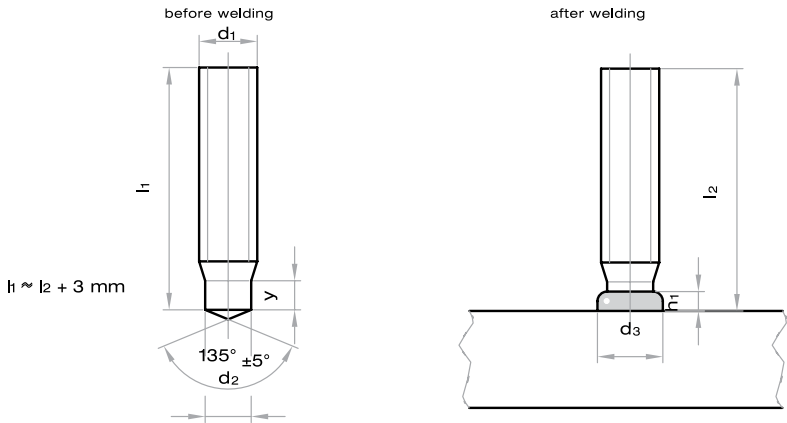




# Studs for drawn arc welding

We supply at short notice threaded and no-thread studs, shear connectors and short cycle studs from our extensive stock and also manufacture special studs to suit your specific requirements in a high standard of quality.

## Reduced threaded studs RD



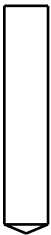
d1	l2	d2	d3	h1	α +/-5°	ymin
M6	siehe Abmessungen 15-80mm	4,7	7	2,8	135°	4
M8		6,2	9	2,5	135°	4
M10		7,9	11,5	3	135°	5
M12		9,5	13,5	4	135°	6
M16		13,2	18	5	135°	7,5/11
M20		16,5	23	6	135°	9/13

The reduced threaded studs type RD are standard according to DIN EN ISO 13918 and can be used as studs with flux filled with aluminium from M6 to M20 together with ceramic ferrules type RF or shielding gas without flux filled with aluminium (max. up to M12). Standard lengths are 15-80 mm and are immediately available ex stock. Non-standard lengths can also be manufactured at short notice.

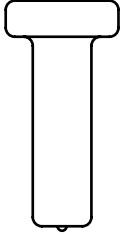


# Studs for drawn arc welding

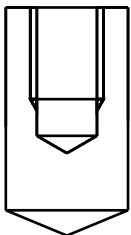
No-thread studs  
from 3-12 mm Ø



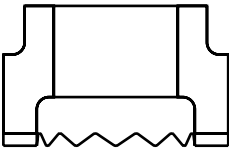
Shear connectors  
from 6-25 mm Ø



Tapped studs  
from M5 to M12



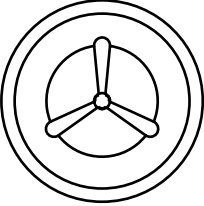
Ceramic  
ferrules for all  
stud types  
according to  
DIN 13918



Insulation pins from  
3-5 mm Ø  
and lengths up to 500 mm

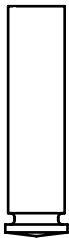


Clips D=38 mm  
from 3-5 mm

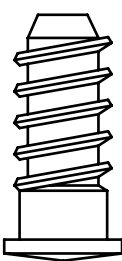


# Studs for short-cycle welding

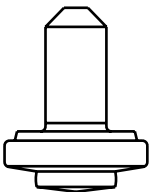
We manufacture short cycle studs to suit specific customer requirements for the automotive supply industry and switchgear cabinet manufacture that comply with the high requirements of all current directives and standards.



Short cycle studs from M5 to M10  
and lengths from 8 to 60 mm



Coarse threaded studs



Grounding or earthing studs





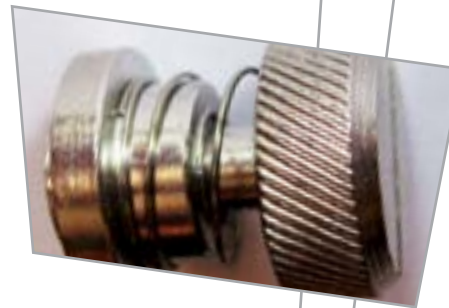
# Clinching

The advantages of the clinching technology are the special to durability and the high torsional strength regarding the transmission of clamping-torques and torques-moments in the connection. The vast diversity of technical execution of the clinching-elements, the economy and precision of the process, make a very broad spectrum in the development of complex sheet metal designs.

Wherever no thermal or other joining process is approved, will the clinching-technology their application.

The industrial sectors include mechanical engineering, apparatus construction, switch cabinet construction, automotive industry, and, for example, the lightweight-constructions in the air - and space technology.

Our delivery program includes: metrics clinching studs, clinching nuts (finishing open and closed).



# Trade fairs

You can also find us at important national and international trade fairs, e.g.

- >> Welding & Cutting, Essen
- >> EUROBLECH, Hanover
- >> BLECHEXPO, Stuttgart

... visit our homepage  
**[www. stud-welding.de](http://www.stud-welding.de)**  
to see current trade fair dates.





**Bolzenschweißtechnik**  
bsk + BTV GmbH

Bolzenschweißtechnik bsk + BTV GmbH  
Daimlerstr. 25  
74252 Massenbachhausen  
Tel +49 (0) 7138/81097-0  
Email: [info@stud-welding.de](mailto:info@stud-welding.de)  
[www.stud-welding.de](http://www.stud-welding.de)

For detailed  
information  
on our

welding studs  
materials  
strengths  
torques  
stud welding units  
and spare parts

visit our homepage:  
[www.stud-welding.de](http://www.stud-welding.de)

Errors and technical modifications reserved  
2019