



# ARC/SC

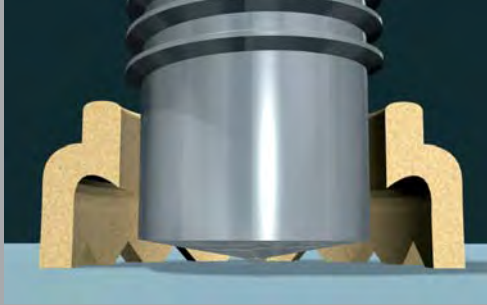
Drawn arc/Short cycle  
stud welding

# ARC

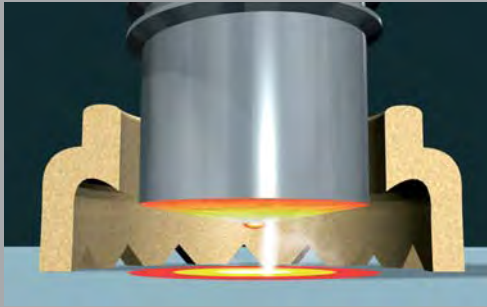
## Drawn arc stud welding with ceramic ferrule or shielding gas

The process drawn arc stud welding is mostly used for stud diameters of 3 to 25 mm and a welding time of 100 to 1,500 ms.

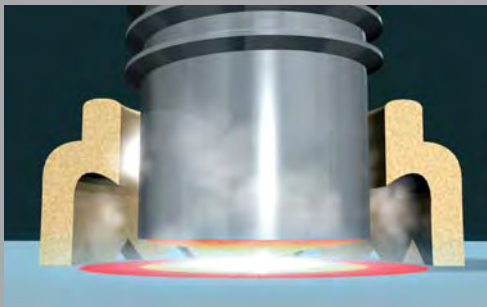
Drawn arc stud welding with ceramic ferrule is recommended for studs with diameter of more than 12 mm. If it is required to protect the weld pool from atmosphere, shielding gas should be used. This process variant is also used with automated applications.



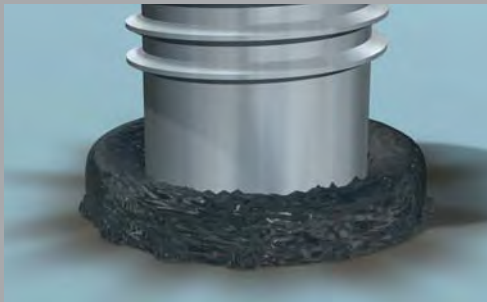
**Welding process with ceramic ferrule: Joining of stud-type welding elements with a diameter 2 to 25 mm (M24) onto thicker sheets of about 2 mm or higher. Mild steel and stainless steel.**



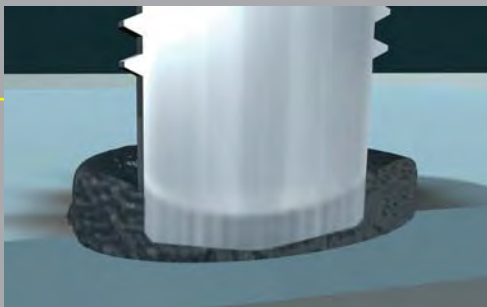
**The welding stud is lifted and a secondary arc (pilot arc) of low current is ignited between stud tip and work piece.**



**Then the ignition of the main arc is carried out. Stud and work piece are melted. The stud is moved to the work piece, the two molten zones join.**



**The molten areas solidify. The short and clean welding process does not require any machining.**

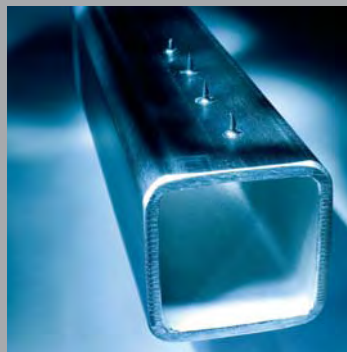


**As a result, an even joint is achieved with a strength which is above the strength of stud and base material.**

**Tremendous time and cost savings  
Unmatched economic efficiency with HBS**

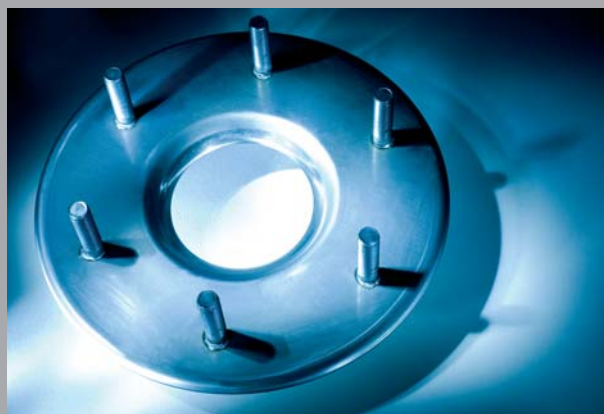
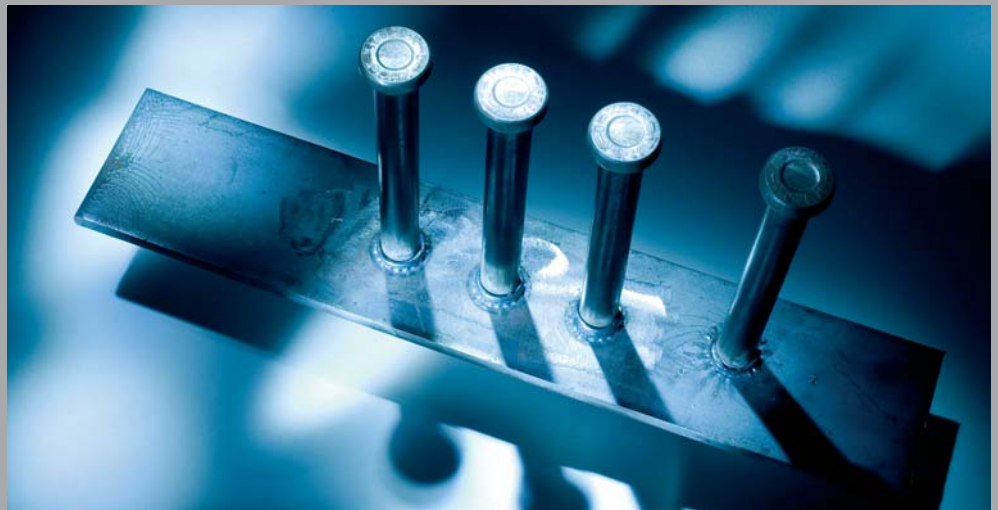
# ARC

**Best Solution  
for Best Result**



Specifically designed for thicker sheets of about 2 mm or higher. Application ranges: steel construction, engineering construction, shipbuilding industry, vehicle construction, structural and civil engineering.

**ARC Drawn arc stud welding with ceramic ferrule, shielding gas or without.**



## ARC Uncompromising drawn arc power units

The ARC series provides both impressive performance and application variety. Highest degree of mobility from the economic efficient up to the highest performance machine on big rubber wheels.

### We match the requirement

They are compact and mobile, the ARC machines, with highest operational convenience and comprehensive safety standards. A microcontroller and an automated function monitoring system guarantee optimum welding. In addition, there is another reserve capacity. Best results with high economic efficiency.



Closed welding connection and high welding quality in spite of minimal heat input.

### Top in any of the items:

- Precise process times via microcontroller
- Lift test
- Function monitoring
- Integrated mains filter
- Maximum operating convenience
- Best price/performance ratio



## The success of systematic measures

### ARC 500

A strong light weight unit with 580 A welding current.

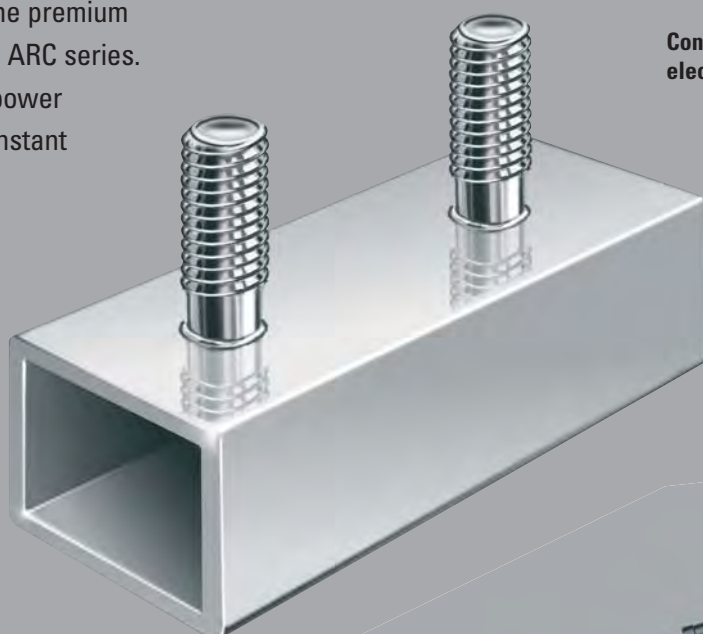
### ARC 800

The top seller – compact, powerful and fully equipped (as an option).

### ARC 1550

Powerful welding unit on rubber wheels, the premium power unit of the ARC series. With electronic power regulation for constant power input.

|                        | ARC 500  | ARC 800                       | ARC 1550  |
|------------------------|--|-------------------------------|---|
| <b>Welding range</b>   | M3 to MR10<br>dia. 2 to 8 mm                                   | M3 to MR12<br>dia. 2 to 10 mm | M3 to M20 RD<br>dia. 2 to 19 mm                               |
| <b>Welding rate</b>    | 5 to 15 studs/min  | 7 to 17 studs/min             | 3 to 35 studs/min<br>(depending on application and stud dia.) |
| <b>Sheet thickness</b> | Especially suitable for thicker sheets of about 2 mm or higher |                               |   |
| <b>Welding current</b> | 580 A  | 800 A                         | 1,550 A<br>Adjustment range<br>500 to 1,550 A                 |
| <b>Welding time</b>    | 5 to 350 msec  | 5 to 1,000 msec               | 5 to 1,500 msec<br>(stepless)                                 |
| <b>Weight</b>          | 31 kg  | 37 kg                         | 133 kg  |



Constantly high welding quality through electronic power regulation (ARC 1550).

### A 12

Especially light and accurate welding gun for industrial application: welding range dia. 2 to 12 mm.

### A 16

Rigid and ergonomic casing. Highest weld quality achieved by a double damping system which is unique in the world. Specially designed for high clock sequences with big diameters. Welding range dia. 3 to 16 mm.



A12/A16 with integrated automatic length compensation.

## IT Newest inverter technology for drawn arc stud welding

The first complete inverter series with welding current up to 2,600 A.

### Best welding quality

Very high arc stability even at weak welding current. In this way, a constantly optimized welding quality is achieved even with large mains voltage fluctuations.

### Ahead of competition by dynamics

Highly dynamic regulation of the welding process through high process flexibility.

### Highly cost effective

The innovative inverter welding power source provides a higher efficiency of 80 % compared with conventional power sources. In this way, energy consumption is reduced by 50% (smaller generators = 50% less diesel fuel consumption).



Realization of highest quality demands, even for welding on difficult geometrical shapes.

## Top in any of the items:

*In addition to the features of the ARC series, the inverter power units provide the following characteristics.*

- Outstanding welding quality – very high arc stability
- Process monitoring
- High process flexibility (clock frequency 30 kHz)
- Compact, highly mobility
- Up to 100% higher welding rate compared with conventional transformer machines



|                                 | IT 1002  | IT 2002                       | IT 3002                       | IT 90                         | IT 130                        |
|---------------------------------|--|-------------------------------|-------------------------------|-------------------------------|-------------------------------|
| <b>Welding range</b>            | M3 to MR16<br>dia. 2 to 14 mm  | M3 to M24<br>dia. 2 to 22 mm  | M3 to M24<br>dia. 2 to 25 mm  | M3 to M24<br>dia. 2 to 22 mm  | M3 to M24<br>dia. 2 to 25 mm  |
| <b>Welding rate</b>             | M12=<br>25 studs/min   | dia. 22=<br>7 studs/min       | dia. 25=<br>6 studs/min       | dia. 22=<br>4 studs/min       | dia. 25=<br>5 studs/min       |
| <b>Sheet thickness</b>          | Minimum metal sheet thickness is (ceramic ferrule) and 1/8 (shielding gas) of stud diameter, however, at least 1 mm. |                               |                               |                               |                               |
| <b>Welding current</b>          | 1,000 A<br>(max.)  | 2,000 A<br>(max.)             | 2,600 A<br>(max.)             | 2,000 A<br>(max.)             | 2,500 A<br>(max.)             |
| <b>Current adjustment range</b> | 100 to 1,000 A<br>(stepless)   | 300 to 2,000 A<br>(stepless)  | 300 to 2,600 A<br>(stepless)  | 300 to 2,000 A<br>(stepless)  | 300 to 2,500 A<br>(stepless)  |
| <b>Welding time</b>             | 5 to 1,000 msec<br>(stepless)  | 5 to 1,500 msec<br>(stepless) | 5 to 1,500 msec<br>(stepless) | 5 to 1,500 msec<br>(stepless) | 5 to 1,500 msec<br>(stepless) |
| <b>Weight</b>                   | 29 kg  | 95 kg                         | 160 kg                        | 140 kg                        | 160 kg                        |

## The success of systematic measures

### IT 1002

Our economically efficient model for industry and job site applications. The topseller of the inverters.

### IT 2002

Robust and very powerful. Very high welding rate, especially for job site applications.

### IT 3002

The most powerful inverter for job site applications. Welding rate with dia. 25 = 6 studs/min.

### IT 90/IT 130

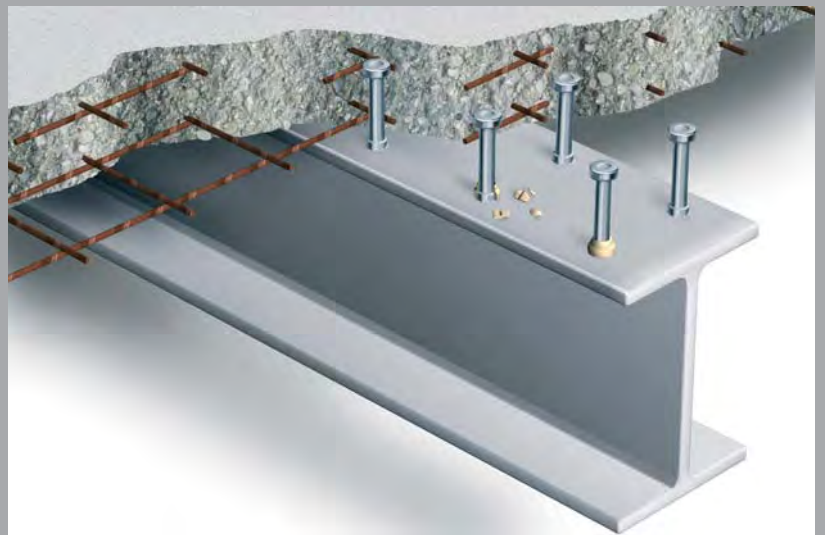
Specially developed for industrial use with integrated process monitoring and RS232 interface for data output. Optional 4 gun connections (IT 90).

### A 22/A25

Especially rigid casing. Highest welding quality through a worldwide unique double damping system.

### A 12/A16

Description see page 5.



Shear connector application in steel composite construction.



A22/A25 with integrated automatic length compensation.

# SC

## Short cycle drawn arc stud welding

### High current, shorter duration of welding time

The welding sequence is the same as the sequence of drawn arc welding (ARC), however, with relatively higher currents and shorter welding times ( $\leq 100$  msec). The short cycle drawn arc stud welding is very suitable for stud diameters up to 16 mm on thin metal sheets.

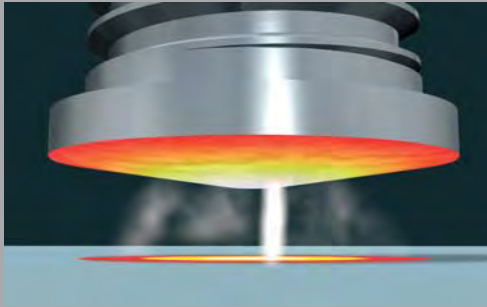
### Also without shielding gas

Up to 8 mm stud diameter, the process is often carried out without weld pool protection. Normally studs with flange are used to achieve high tensile strengths in spite of pores in the weld zone.

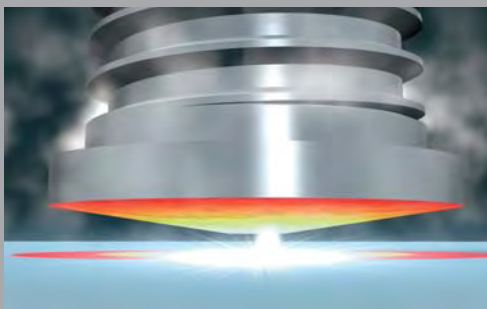
The short cycle process is especially suitable for welding of material combinations like steel (base material), stainless steel (stud) as well as aluminum. To achieve a high welding quality, use of shielding gas is recommended.



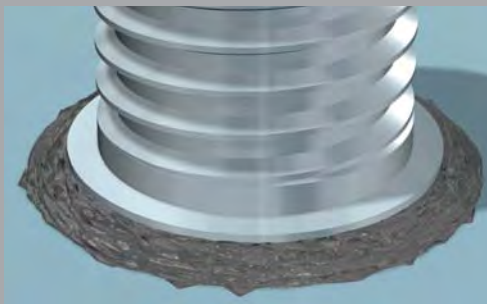
Joining of stud-type welding elements with a diameter 2 to 16 mm onto thin sheets, min. 0.5 mm. Mild steel, stainless steel and aluminum.



The welding stud is lifted and a secondary arc (pilot arc) of low current is ignited between stud tip and work piece.



Then the ignition of the main arc is carried out. Stud and work piece are melted. The stud is moved to the work piece, the two molten zones join.



The molten areas solidify. The short and clean welding process does not require any machining.



The low thermal, accurate load provides welding onto thin sheets.

**Best results**

**Best price-performance ratio**



# SC

**Best Solution  
for Best Result.**



**Multiple applications  
with: studs, tapped pads  
and pins onto thin metal  
sheets. A wide field of  
application is in vehicle  
construction, in particu-  
lar using christmas tree  
studs to fasten conduits  
and trims.**



**With SCD and IT power  
units for short cycle  
drawn arc stud welding.  
(with and without shiel-  
ding gas).**

**SCD, IT**  
**More productive –**  
**better – stronger**  
**compared with**  
**competition**

**Latest technology**

You select between four different but equally powerful, modern power units – the most competitive machines of their class with best price-performance ratio.



**Application: Fastening element for automotive industry**

**SCD 3201** works to the procedure of capacitor discharge drawn arc stud welding.

Short welding time: 5 to 15 msec

Welding range: dia. 3 to 6 mm

Minimum plate thickness: 0.5 mm

The inverter power units:

**IT 1002/IT 90** work to the procedure of short cycle drawn arc stud welding.

Welding time: 5 to 100 msec

Welding range SC: up to dia. 16 mm

Minimum plate thickness: 0.5 mm

**Top in any**  
**of the items:**

- Best welding results with thin metal sheets
- Short welding time, high welding rate.
- Process monitoring
- RS232 interface
- Function monitoring
- Highest operational convenience
- Capacitor discharge and short cycle drawn arc stud welding with one stud welding unit (SCD 3201)



|                                 | <b>SCD 3201</b><br>Capacitor discharge:                                     | <b>SCD 3201</b><br>Short cycle:                    | <b>IT 1002</b>   | <b>IT 90</b>                  |
|---------------------------------|---|--|--|-------------------------------|
| <b>Welding range</b>            | M3 to M10<br>dia. 2 to 10 mm  | M3 to M8<br>dia. 3 to 6 mm                         | M3 to MR16<br>dia. 2 to 14 mm  | M3 to M24<br>dia. 2 to 22 mm  |
| <b>Welding rate</b>             | 15 to 40 studs/min<br>(depending on application and stud dia.)              | 8 to 15 studs/min                                  | M12=<br>25 studs/min   | dia. 22=<br>4 studs/min       |
| <b>Sheet thickness</b>          | Minimum plate thickness:<br>1/10 of stud diameter, but not less than 0.5 mm |  | Minimum plate thickness:<br>1/8 of stud diameter, but not less than 0.6 mm |                               |
| <b>Welding current</b>          | –   | 900 to 3,000 A stepless<br>(over charging voltage) | 1,000 A (max.)   | 2,000 A (max.)                |
| <b>Current adjustment range</b> | –   | –  | 100 to 1,000 A (stepless)  | 300 to 2,000 A (stepless)     |
| <b>Welding time</b>             | 1 to 3 msec   | 5, 10, 15 msec                                     | 5 to 1,000 msec<br>(stepless)  | 5 to 1,500 msec<br>(stepless) |
| <b>Weight</b>                   | 29 kg   | 29 kg  | 29 kg  | 140 kg                        |

## The success of systematic measures

### SCD 3201

Two in one – the high tech power unit. Equipped with a 85 to 265 V mains connection (instead of 400 V 3-phase current connection!).

To be used with the processes capacitor discharge and capacitor discharge drawn arc stud welding.

### IT 1002/IT 90

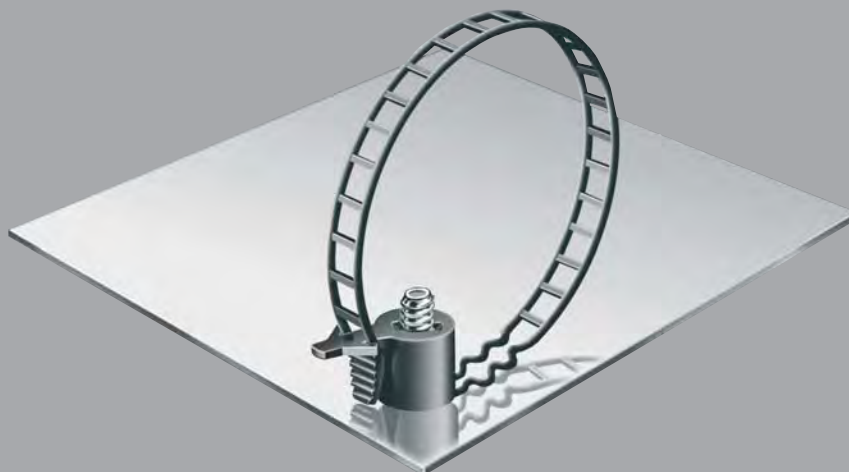
If you want to weld high-strength materials and material combinations (mild steel/stainless steel) or larger stud diameters (up to 16 mm), welding with IT 1002 and IT 90 in short cycle range will be often the only technical solution.

### CA 08

Especially light and accurate welding gun. Welding range M3 to M8.

### A12

Description see page 5.



**Application: Christmas tree studs with plastic fastening element.**





*Distributed by:*

ANTEC ENGINEERING PTY LTD

9 Chicago Avenue, Blacktown, NSW, 2148 Australia

Ph: 61 2 9622 9622 Fax: 61 2 9622 9199

[www.antec.com.au](http://www.antec.com.au)



## Benefit with HBS

Leading through  
technology,  
quality and service.

5 welding processes,  
12 model series  
and more than  
30 model variants.

HBS Bolzenschweiss-  
Systeme GmbH & Co. KG  
Felix-Wankel-Strasse 18  
85221 Dachau / Germany  
Phone +49 (0) 8131 511-0  
Fax +49 (0) 8131 511-100  
[post@hbs-info.com](mailto:post@hbs-info.com)  
[www.hbs-info.com](http://www.hbs-info.com)