



Quality meets Innovation

Stud Welding Systems Catalogue





HBS Bolzenschweiss-Systeme GmbH & Co. KG
Felix-Wankel-Strasse 18
85221 DACHAU
GERMANY

Phone +49 8131 511-0
Fax +49 8131 511-100
E-Mail post@hbs-info.com
Web www.hbs-info.com



reddot award
winner

Presented with the Red Dot Design Award, one of the most prestigious design competitions, which is considered to be the yardstick for the highest design quality at international level. This seal of quality confirms the innovative design excellence of HBS.

Transmission and duplication of this document, dissemination and notification of the contents are not permitted unless expressly approved.

All rights, errors and technical amendments reserved.

© HBS Bolzenschweiss-Systeme GmbH & Co. KG



HBS - World



HBS - Germany

HBS - USA

HBS - China

HBS - Singapore



Table of Contents

Quality alive	8
Stud Welding - Advantages	9

Manual Systems

1	CD - Capacitor Discharge	10
1.1.	Applications	10
1.2.	Configuration CD	14
1.3.	Battery powered	
	Pegasar 500 accu, Pegasar 500 accu Insulation	16
1.4.	CDi Series power sources	
	CDi 1502, CDi 2302, CDi 3102	18
1.5.	Guns	
	C 06-3, C 08, CA 08, CI 03	19
1.6.	Mounting heat cost allocators	
	ACCU-TWIN	20
2	ARC/SC - Drawn ARC and Short Cycle	22
2.1.	Applications - Drawn ARC	22
2.2.	Applications - Short Cycle	24
2.3.	Inverter technology	26
2.4.	Configuration ceramic ferrule - up to M16 / 5/8" (type RD)	28
2.5.	Configuration ceramic ferrule - up to M24 (dia. 25 mm) / 1"	30
2.6.	Overview ceramic application (UD, PD, DD, RD, ID)	32
2.7.	Overview ceramic application (SD)	34
2.8.	Configuration shielding gas	36
2.9.	Configuration short cycle	38
2.10.	Inverter Series power sources	
	Visar 650, IT 1002	40
	IT 2002, IT 3002, IT 130	41
	IT 50, IT 90	42
	IT Mobility System	43
2.11.	Transformer Series power sources	
	ARC 500, ARC 800, ARC 1550	44
2.12.	Guns	
	AI 06, CA 08, A 12	46
	A 16, A 22, A 25	47

3	MARC - Magnetic rotating ARC	48
3.1.	Applications	48
3.2.	Nut welding system	
	MARC 1 A	50
	MARC 1 W	51
3.3.	Nut welding system	
	PC-M3	52

Automatic Systems

4	Automatic - Components	56
4.1.	Configuration automatic gun	56
4.2.	Configuration CD Engineering	58
4.3.	Configuration SC Engineering	60
4.4.	Overview automatic power sources	62
4.5.	Automatic power sources	
	CDi 1502, CDMi 2402, CDMi 3202	63
	ARC 800, ARC 1550	64
	IT 1002, IT 50, IT 90	65
4.6.	Fully automatic stud feeder	
	VBZ-3	66
4.7.	Automatic gun	
	PAH-1	67
4.8.	Welding heads	
	KAH 412, KAH 412 LA	68
5	Automatic - Automatic stud welding machines	70
5.1.	PC-S	70
5.2.	CPW Series	71
5.3.	MPW Series	72
6	Automatic - Accessories	74
	Welding elements	
	Overview	76

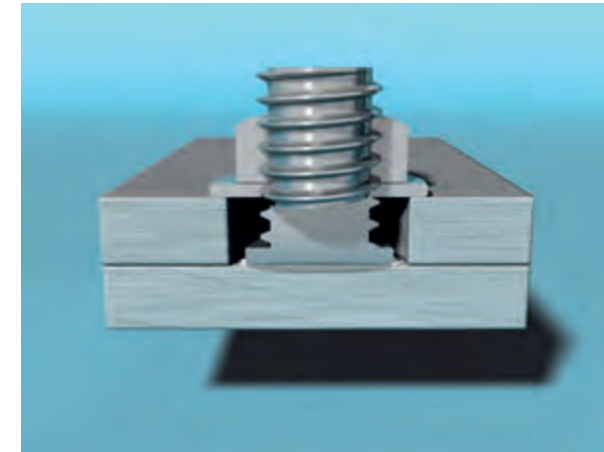


Quality Management System according to ISO 9001:2008

- Certified since 1994
- Implementation of our Company Policy and Corporate Mission
- Guaranteed high quality of our products and services
- Well-defined and clearly structured processes
- Continuous improvement of our:
 - management processes
 - business processes
 - supporting processes

Stud Welding - Advantages

Saves time. Saves money. Unchallenged.

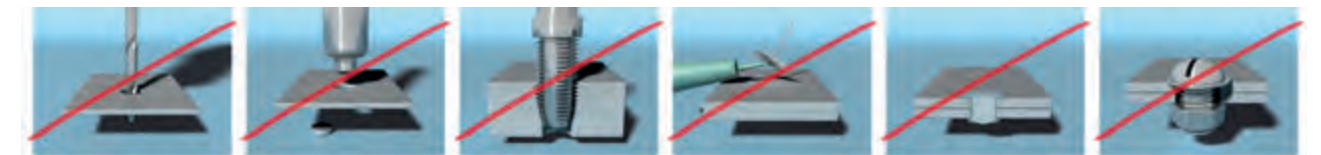


No reworking!

In many areas stud welding is the most economic fastening method for components. If using thin sheet metal, stud welding is often the only technical solution.

Tremendous time and cost savings

No: drilling - punching - threading - gluing - riveting - screwing



New design potentials

- Very low distortion by extremely short welding time.
- No leaking caused by drilled holes.
- High strength.
- One-sided accessibility of the component is sufficient.
- Weldable even onto very thin plates.
- Joining of different materials is possible.

Unsurpassed economy

- Can be automated to a very high degree.
- Very short welding time (1 ms to 1.500 ms), fast weld rates.
- Fast and easy handling leads to high productivity.
- No marks on backside of coated or high alloyed plates.
- Low prices for standard studs.

CD

Capacitor Discharge (CD) stud welding with tip ignition

HBS power units provide outstanding reductions in costs and time. Every weld is precise avoiding any need for post treatment.

The recipe for success:

Extremely short welding time! (1 to 3 ms). No additional welding products are needed. Because of a very low thermal load, the welding zone is minimal. In this way, distortion of the work piece is avoided. Often this is the only applicable technical solution.

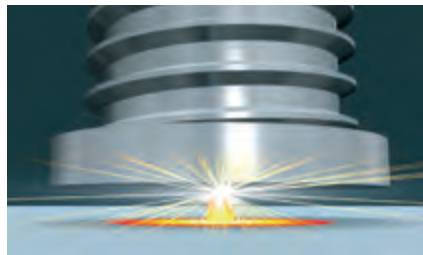
Contact or gap

In contrast to contact welding, with gap welding the stud is positioned at a defined distance shortly before welding starts. This creates a higher plunging speed which leads to a shorter welding time (only 1 ms!).

This characteristic also allows welding of difficult materials like e.g. aluminium and brass.



Joining of stud-type welding elements with a diameter M3 to M10 (dia. 2 to 10 mm) onto thin sheets, min. 0.5 mm. Mild steel, stainless steel, aluminium and brass.



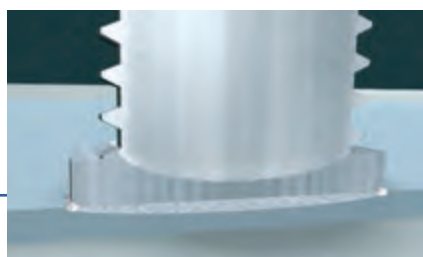
An arc is ignited between the face of stud and the surface of a work piece.



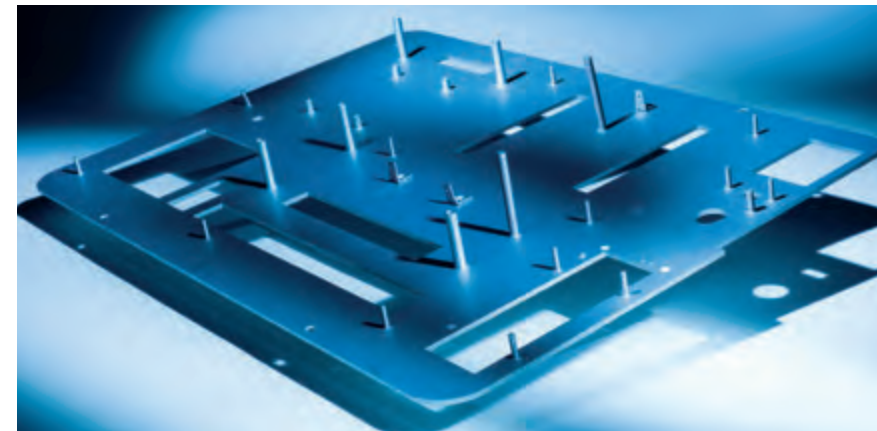
Both parts are melted, the stud is gently pressed against the work piece and then joined together.



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



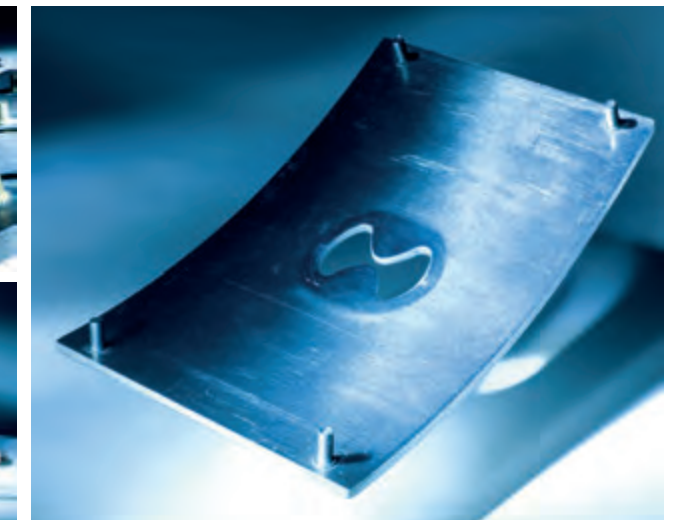
As a result, an even and complete joint is achieved with a strength which is above the strength of stud and base material. The low thermal load provides welding onto thin sheets without damage to the rear side.



CD
Best Solution
Best Results

Typical applications include: Sheet metalwork, electronic industries, switchboard cabinets, laboratory and medical equipment, food industry, household appliances, etc.

When studs are welded to thin sheets (steel, aluminium and brass), the procedure of tip ignition will always be the most cost effective process and sometimes the only solution.



Keep it simple. Save time and money.
Unmatched economic efficiency with HBS.

CD

Cutting edge technology is combined with time proven power units

The professional generation

The HBS R&D department unceasingly reviews components for new, improved, cost effective and efficient technology to keep all HBS products at the cutting edge.



All the available experience and knowledge in the stud welding industry are part of HBS products which we have been developing for over 40 years. HBS welding elements are a part of this technology.



Cutting edge technology

C 06-3

Simple – no setting required for lift and spring pressure. Stud welding gun specially paired with the power source for outstanding results.

CA 08

High-performance stud welding gun for tip ignition process of gap welding. High accuracy provided by zero-play ball linear bearing for guiding the welding piston.

C 08

Rugged casing with ergonomic grip. All-rounder also used for welding aluminium studs to M4 (#8).

CI 03

For welding cupped head pins. Fixing HVAC insulation matting (heating, ventilation and air-conditioning).





Material	Diameter	Catalogue
	M3 to M10	Welding Elements
Type PT		
Threaded stud		

Material	Diameter	Catalogue
	M4 to M8	Welding Elements
Type PT		
Paint clearing threaded stud		

Material	Diameter	Catalogue
	5 mm	Welding Elements
Type PT		
Fir tree stud		

Material	Diameter	Catalogue
	3 to 7,1 mm	Welding Elements
Type UT		
Unthreaded stud (pin)		

Material	Diameter	Catalogue
	M3/dia.5mm - M5/dia.7,1mm	Welding Elements
Type IT		
Stud (pin) with internal thread		

Material	Diameter	Catalogue
	6,3 mm	Welding Elements
Type Ground clips		
Ground clip		

Material	Welding range	Page
	M3 to M6 #4 to 1/4"	16
Pegasar 500 accu		
Mobile, light and robust battery powered for construction sites and workshops (IP 44). Intuitive, simple to operate thanks to quick-access buttons and pre-stored parameters.		

Ground cable
92-40-154

Material	Welding range	Page
	M3 to M8 #4 to 5/16"	18
CDi 1502		
For construction sites and workshops (IP 23). Welds to M8 (5/16") on thin sheets.		

Material	Welding range	Page
	M3 to M8 (M10) #4 to 5/16" (7/16")	18
CDi 2302		
All-rounder for construction sites and workshops (IP 23). Welds limited to M10 (7/16") on thin sheets.		

Ground cable
92-40-095

Material	Welding range	Page
	M3 to M10 #4 to 7/16"	18
CDi 3102		
Energy package for construction sites and workshops (IP 23). For larger studs with energy reserve for coated surfaces.		

Material	Welding range	Page
	M3 to M6 (Aluminium up to M4) #4 to 1/4" (Aluminium up to #8)	19
C 06-3 with foot ring		
Universal design for use on flat surfaces. Easy handling. No setting for lift and spring pressure. Aluminium to M4 (#8).		

Material	Welding range	Page
	M3 to M6 (Aluminium up to M4) #4 to 1/4" (Aluminium up to #8)	19
C 06-3 with centering tube PPR-2		
Used for welding with templates and for protection against spatter. Easy handling. No setting for lift and spring pressure. Aluminium to M4 (#8).		

Material	Welding range	Page
	M3 to M8 (M10) #4 to 5/16"	19
C 08 with foot ring		
Universal design for use on flat surfaces. All-rounder also used for welding galvanised base material. Aluminium to M4 (#8).		

Material	Welding range	Page
	M3 to M8 (M10) #4 to 5/16"	19
C 08 with centering tube PPR-2		
Used for welding with templates and for protection against spatter. All-rounder also used for welding galvanised base material. Aluminium to M4 (#8).		

Material	Welding range	Page
	M3 to M8 (M10) #4 to 5/16" (7/16")	19
CA 08 with foot ring		
Universal design for use on flat surfaces. Used to avoid rear side marking on thin sheets. Aluminium to M6 (1/4"). Brass to M4 (#8).		

Material	Welding range	Page
	M3 to M8 (M10) #4 to 5/16" (7/16")	19
CA 08 with centering tube PPR-2		
Used for welding with templates and for protection against spatter. Gap gun used to avoid rear side marking on thin sheets and provides optimal results with aluminum studs to M6 (1/4").		

Accessories
Page 19

Legend	
Material	Stud-/Welding material
	Mild steel
	Stainless steel
	Aluminium
	Brass



Pegasar 500 accu NEW Pegasar 500 accu NEW Insulation



Battery powered

- Mobile, light and robust battery powered for construction sites and workshops (IP 44)
- Intuitive, simple to operate thanks to quick-access buttons and pre-stored parameters

M3 to M6
#4 to 1/4"



Battery powered

- Mobile, light and robust battery powered for construction sites (IP 44)
- Intuitive, simple to operate thanks to quick-access buttons and pre-stored parameters

Cupped head pins: dia. 2 and 2.7 mm
CD ISO nail: dia. 2 and 3 mm



Welding process	CD
Welding material	
Technology	Inverter-Capacitor Charging Technology
Welding range	Studs (steel) M3 to M6 / #4 to 1/4" Studs (aluminium) M3 to M4 / #4 to #8 M3 / #4 = 40 studs/min. (Charging voltage 55 V), M6 / 1/4" = 20 studs/min. (Charging voltage 95 V)
Welding rate	
Count of weldings per battery	400 welds (M6 / 1/4")
Capacitance	100 000 µF
Welding time	1 to 3 ms
Energy	500 Ws
Charging voltage	50 to 100 V (stepless voltage regulation)
Power source	Capacitor
Battery	25.55 V / 5.7 Ah / 145.64 Wh (LiNiCoAlO2)
Battery charging time	Max. 2.5 h
Battery life	At least 400 charging cycles (at 800 charging cycles still approx. 60 % of the initial capacity)
Dimension LxWxH	475 x 300 x 355 mm / 18.70" x 11.81" x 13.98" (with handle)
Weight	12 kg / 26.46 lbs incl. battery, 10.7 kg / 23.59 lbs without battery
Primary power	100 V to 240 V, 50/60 Hz, 10 AT (slow blow); in battery operation: 25.55 V
Connected load	500 W
Cooling type	F (temperature controlled cooling fan)
IP	With inserted battery: IP 44, without battery: IP 23
Suitable guns	C 06-3

Welding process	CD
Welding material	
Technology	Inverter-Capacitor Charging Technology
Welding range	Cupped head pins dia. 2 and 2.7 mm CD ISO nails dia. 2 and 3 mm Cupped head pin: dia. 2.7 mm = 20 pins/min (Charging voltage 85 V) CD ISO nail: dia. 3 mm = 20 nails/min (Charging voltage 90 V)
Welding rate	400 welds (cupped head pin dia. 2.7 mm)
Count of weldings per battery	400 welds (cupped head pin dia. 2.7 mm)
Capacitance	100 000 µF
Welding time	1 to 3 ms
Energy	500 Ws
Charging voltage	50 to 100 V (stepless voltage regulation)
Power source	Capacitor
Battery	25.55 V / 5.7 Ah / 145.64 Wh (LiNiCoAlO2)
Battery charging time	Max. 2.5 h
Battery life	At least 400 charging cycles (at 800 charging cycles still approx. 60 % of the initial capacity)
Dimension LxWxH	475 x 300 x 355 mm / 18.70" x 11.81" x 13.98" (with handle)
Weight	12 kg / 26.46 lbs incl. battery, 10.7 kg / 23.59 lbs without battery
Primary power	100 V to 240 V, 50/60 Hz, 10 AT (slow blow); in battery operation: 25.55 V
Connected load	500 W
Cooling type	F (temperature controlled cooling fan)
IP	With inserted battery: IP 44, without battery: IP 23
Suitable guns	CI 03, C 06-3

Displays



Pegasar 500 accu (metric)



Pegasar 500 accu (imperial)



Pegasar 500 accu Insulation

Legend

Welding process: CD = Capacitor discharge stud welding

Mild steel Stainless steel Aluminium

Order No.
92-10-0500 (Plug E+F; Europe + China), diameter buttons „metric“
92-12-0500 (Plug B; USA + Kanada), diameter buttons „imperial“
92-13-0500 (Plug B; Japan), diameter buttons „metric“
92-40-154 (Ground cable)
88-23-484 (Accu 150 - battery; Lithium-Ionen-Akku)
88-23-661 (ACCU CHARGER 150 - charging unit for battery type Accu 150 - Plug E+F)
88-24-066 (ACCU CHARGER 150 - charging unit for battery type Accu 150 - Plug B)
88-24-466 (Toolbag)

Order No.
92-10-0510 (Plug E+F; Europe + China), diameter buttons „metric“
92-40-091 (Ground cable for cupped head pins; CI 03)
92-40-154 (Ground cable for CD ISO nails; C 06-3)
88-23-484 (Accu 150 - battery; Lithium-Ionen-Akku)
88-23-661 (ACCU CHARGER 150 - charging unit for battery type Accu 150 - Plug E+F)
88-24-066 (ACCU CHARGER 150 - charging unit for battery type Accu 150 - Plug B)
88-24-466 (Toolbag)

Quick battery change



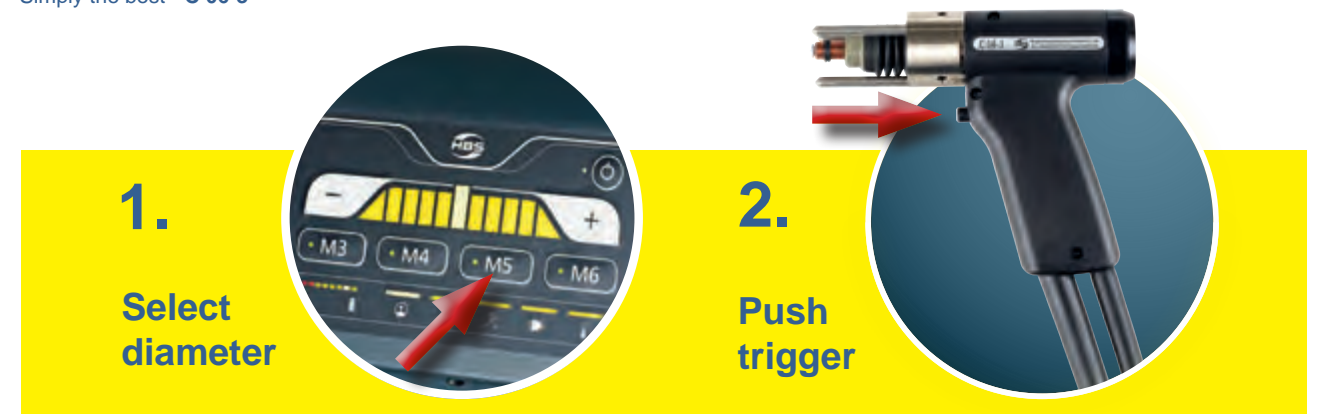
Toolbag

For Pegasar 500 accu and Visar 650
Order no. 88-24-466



Just 2 steps! To the perfect weld

Simply the best - C 06-3



- Fastest units in its class on the market
- Multi voltage
- Globally deployable

CDi 1502



- For construction sites and workshops (IP 23)
- Welds to M8 (5/16") on thin sheets

M3 to M8
#4 to 5/16"



Welding process	CD
Welding material	
Technology	Inverter-Capacitor Charging Technology
Display	Digital
Welding range	M3 to M8, dia. 2 to 8 mm / #4 to 5/16", dia. 14 ga to 5/16" Cupped head pins: dia. 2 and 2.7 mm / 14 ga and 12 ga Insulation pins: dia. 2 and 3 mm / 14 ga and #4
Welding rate	M3 / #4 = 40 studs/min. (voltage 60 V) M8 / 5/16" = 14 studs/min. (voltage 200 V)
Capacitance	66 000 µF
Welding time	1 to 3 ms
Energy	1600 Ws
Charging voltage	50 to 220 V (stepless voltage regulation)
Primary power	230 V/115 V*, 50/60 Hz, 10 AT (slow blow) *alternative primary power see „Order No.“
Connected load	600 VA
Power source	Capacitor
Cooling type	F (temperature controlled cooling fan)
IP-Code	IP 23
Dimension LxWxH (without handle)	400 x 205 x 250 mm / 15.75" x 8.07" x 9.84"
Weight	14 kg / 30.87 lbs
Suitable guns	C 08, CA 08, CI 03

Order No.

92-10-1502B (230 V)
92-12-1502B (115 V)
92-13-1502B (100 V)

92-40-095 (Ground cable, 2.5 m, 25 mm², 2 vice grips 10")

Für CI 03:

92-40-091 (Ground cable, 6.7 m, 1 Vice grip 10")

CDi 2302



- All-rounder for construction sites and workshops (IP 23)
- Welds limited to M10 (7/16") on thin sheets

M3 to M8 (M10)
#4 to 5/16" (7/16")



Welding process	CD
Welding material	
Technology	Inverter-Capacitor Charging Technology
Display	Digital
Welding range	M3 to M8 (M10 limited), dia. 2 to 8 mm (dia. 10 mm limited) / #4 to 5/16" (7/16" limited), dia. 14 ga to 5/16" (dia. 3/8" limited)
Welding rate	M3 / #4 = 33 studs/min. (voltage 60 V) M8 / 5/16" = 12 studs/min. (voltage 170 V) M10 / 7/16" = 9 studs/min. (voltage 210 V)
Capacitance	99 000 µF
Welding time	1 to 3 ms
Energy	2400 Ws
Charging voltage	50 to 220 V (stepless voltage regulation)
Primary power	230 V/115 V*, 50/60 Hz, 10 AT (slow blow) *alternative primary power see „Order No.“
Connected load	600 VA
Power source	Capacitor
Cooling type	F (temperature controlled cooling fan)
IP-Code	IP 23
Dimension LxWxH (without handle)	480 x 205 x 250 mm / 18.90" x 8.07" x 9.84"
Weight	17 kg / 37.48 lbs
Suitable guns	C 08, CA 08

Order No.

92-10-2302B (230 V)
92-12-2302B (115 V)
92-13-2302B (100 V)

92-40-095 (Ground cable, 2.5 m, 25 mm², 2 vice grips 10")

CDi 3102



- Energy package for construction sites and workshops (IP 23)
- For larger studs with energy reserve for coated surfaces

M3 to M10
#4 to 7/16"



Welding process	CD
Welding material	
Technology	Inverter-Capacitor Charging Technology
Display	Digital
Welding range	M3 to M10, dia. 3 to 10 mm / #4 to 7/16", dia. #4 to 3/8"
Welding rate	M3 / #4 = 20 studs/min. (voltage 50 V) M8 / 5/16" = 10 studs/min. (voltage 140 V) M10 / 7/16" = 6 studs/min. (voltage 200 V)
Capacitance	132 000 µF
Welding time	1 to 3 ms
Energy	3200 Ws
Charging voltage	50 to 220 V (stepless voltage regulation)
Primary power	230 V/115 V*, 50/60 Hz, 10 AT (slow blow) *alternative primary power see „Order No.“
Connected load	600 VA
Power source	Capacitor
Cooling type	F (temperature controlled cooling fan)
IP-Code	IP 23
Dimension LxWxH (without handle)	480 x 205 x 250 mm / 18.90" x 8.07" x 9.84"
Weight	18 kg / 39.68 lbs
Suitable guns	C 08, CA 08

Order No.

92-10-3102B (230 V)
92-12-3102B (115 V)
92-13-3102B (100 V)

92-40-095 (Ground cable, 2.5 m, 25 mm², 2 vice grips 10")

Legend Welding process: CD = Capacitor discharge stud welding

Mild steel Stainless steel Aluminium Brass



C 06-3



- Easy handling
- No setting for lift and spring pressure
- Aluminium to M4 (#8)

M3 to M6
#4 to 1/4"



Suitable stud welding unit	Pegasar 500 accu, Pegasar 500 accu Insulation
Welding process	CD (contact)
Stud material	
Welding range	M3 to M6, dia. 2 to 6 mm / #4 to 1/4", dia. 14 ga to 1/4"
Stud length	6 to 40 mm / 0.24" to 1.57"; longer studs (> 40 mm / 1.57") with optional accessories
Stud type	Any type or shape (special chucks if required)
Lift	--
Spring pressure	--
Welding cable	3 m / 9.84'; 25 mm ² , SK 50
IP-Code	IP 20
Workplace noise level	> 90 dB (A) may occur during welding
Dimension LxWxH (without cable)	170 x 40 x 140 mm / 6.70" x 1.57" x 5.51"
Weight (without cable)	0.5 kg / 1.10 lbs (without cable)

Order No.

¹⁾ 92-20-275 (Tripod)
²⁾ 92-20-288 (PPR-2/CD)

92-40-050 (Accessories up to 6 mm – chucks M3 to M6, socket wrench)
92-40-118 (Accessories up to 1/4" – chucks #4, #6, #8, #10, 1/4", socket wrench)

C 08



- All-rounder also used for welding galvanised base material
- Aluminium to M4 (#8)

M3 to M8 (M10)
#4 to 5/16" (7/16")



Suitable stud welding unit	CDi series, CDMi series
Welding process	CD (contact)
Stud material	
Welding range	M3 to M8 (M10 with special equipment), dia. 2 to 8 mm / #4 to 5/16" (7/16" with special equipment), dia. 14 ga to 5/16"
Stud length	6 to 40 mm / 0.24" to 1.57"; longer studs with optional accessories
Stud type	Any type or shape (special chucks if required)
Lift	--
Spring pressure	Adjustable, arresting
Welding cable	6.5 m / 21.33'; 25 mm ² , SK 50
IP-Code	IP 20
Workplace noise level	> 90 dB (A) may occur during welding
Dimension LxWxH (without cable)	170 x 40 x 140 mm / 6.70" x 1.57" x 5.51"
Weight (without cable)	0.5 kg / 1.10 lbs

Order No.

³⁾ 92-20-256 (Tripod)
⁴⁾ 92-20-286 (PPR-2/CD)

92-40-018 (Accessories CD M3 to M8)

CA 08



- Used to avoid rear side marking on thin sheets
- Aluminium to M6 (1/4")
- Brass to M4 (#8)

M3 to M8 (M10)
#4 to 5/16" (7/16")



Suitable stud welding unit	CDi series, CDMi series
Welding process	CD (gap)
Stud material	
Welding range	M3 to M8 (M10 with special equipment), dia. 2 to 8 mm / #4 to 5/16" (7/16" with special equipment), dia. 14 ga to 5/16"
Stud length	6 to 40 mm / 0.24" to 1.57"; longer studs with optional accessories
Stud type	Any type or shape (special chucks if required)
Lift	Adjustment range 4.5 mm / 0.18", lockable
Spring pressure	Adjustable, arresting
Welding cable	3 m / 9.84'; 25 mm ² , SK 50
IP-Code	IP 20
Workplace noise level	> 90 dB (A) may occur during welding
Dimension LxWxH (without cable)	190 x 40 x 140 mm / 7.48" x 1.57" x 5.51"
Weight (without cable)	0.7 kg / 1.54 lbs

Order No.

⁵⁾ 92-20-255 (Tripod)
⁶⁾ 92-20-285 (PPR-2/CD)

92-40-018 (Accessories CD M3 to M8)

CI 03



- Especially suitable for welding on cupped head pins (HVAC)

Dia. 2/2.7 mm
14 ga/12 ga



Suitable stud welding unit	CDi 1502, Pegasar 500 accu Insulation
Welding process	CD (contact)
Stud material	
Welding range	Cupped head pins Dia. 2/2.7 mm / 14 ga/12 ga
Stud length	9.5 to 152.4 mm / 0.37" to 6.00"
Stud type	Cupped head pins
Lift	--
Spring pressure	Adjustable, arresting
Welding cable	9.3 m / 30.51'; 6 mm ² , SK 50
IP-Code	IP 20
Workplace noise level	> 90 dB (A) may occur during welding
Dimension LxWxH (without cable)	175 x 50 x 145 mm / 6.89" x 1.97" x 5.71" (without leg assembly)
Weight (without cable)	0.7 kg / 1.54 lbs

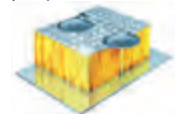
Order No.

¹⁾ 92-20-275 (Tripod)
²⁾ 92-20-288 (PPR-2/CD)

92-40-050 (Accessories up to 6 mm – chucks M3 to M6, socket wrench)
92-40-118 (Accessories up to 1/4" – chucks #4, #6, #8, #10, 1/4", socket wrench)

Order No.

92-20-254
92-40-063A (Accessories for cupped head pins)



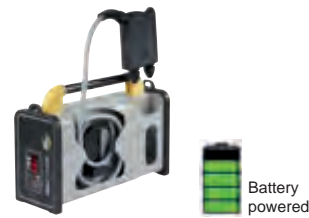
Application: Cupped head pins. Welded with gun CI 03.

Legend Welding process: CD = Capacitor discharge stud welding

Mild steel Stainless steel Aluminium Brass

- Battery operated
- Ready to go
- Rubber edge protection

ACCU-TWIN



• Especially suitable for welding heat costs measurement systems through twin stud welding

2 x M3

Welding process	CD
Welding material	● ●
Welding range	2 x M3
Welding rate	2 twin welds per minute
Capacitor charging time	approx. 30 sec
Battery	12 V, 5 Ah (leakproof)
Battery capacity	200 twin M3 welds
Battery charging time	Max. 10 hours
Battery life	Min. 200 charging cycles
Stud spacing	Stepless adjustable from 25 mm up to 61 mm (from 19 mm upon request)
Welding gun cable length	approx. 1.1 m (92-10-2280A) approx. 2.1 m (92-10-2285B)
Capacitance	80 000 µF
Energy	325 Ws (92-10-2280A) 375 Ws (92-10-2285B)
Charging voltage	Max. 90 V (92-10-2280A) max. 97 V (92-10-2285B)
Power source	Capacitor
Dimension LxWxH	360 x 135 x 210 mm (Gun 165 x 25 x 95 mm)
Weight	7 kg (incl. welding gun - 550 g)
Gun	Supplied fixed – non interchangeable

Order No.

- 92-10-2280A (1.1 m)
- 92-10-2285B (2.1 m)



Legend Welding process: CD = Capacitor discharge stud welding

- Mild steel ● Stainless steel



- 1) Convenient cable wrap system
- 2) External gun compartment



- 3) Intelligent energy display
- 4) Counter for completed welds



- 5) Rubber edge protection





ARC

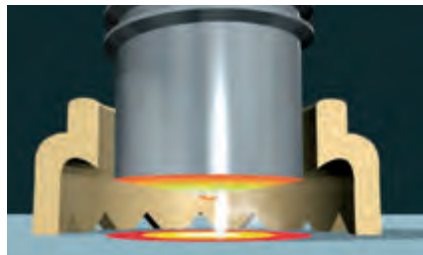
Drawn arc (ARC) stud welding with ceramic ferrule or shielding gas

The process drawn arc stud welding is mostly used for stud diameters of 3 to 25 mm and a welding time of 100 to 1500 ms.

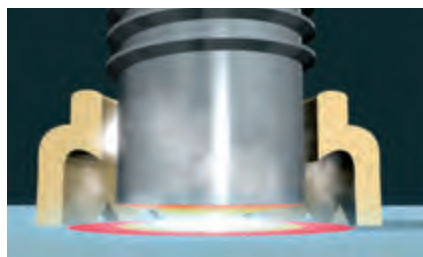
Drawn arc stud welding with ceramic ferrule is recommended for studs with diameter of more than 12 mm. If it is required to protect the weld pool from atmosphere, shielding gas should be used. This process variant is also used with automated applications.



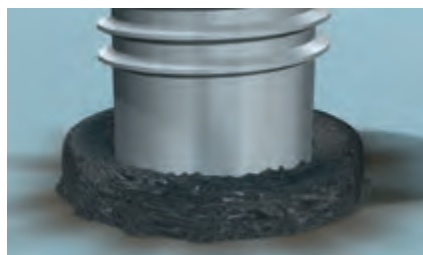
Welding process with ceramic ferrule: Joining of stud-type welding elements with a diameter 2 to 25 mm (M24) onto thicker sheets of about 2 mm or higher. Mild steel and stainless steel.



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 strength is achieved which is above the stud and base material.

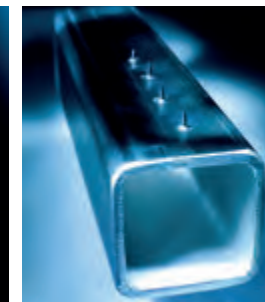
Tremendous time and cost savings
Unmatched economic efficiency with HBS

ARC

Best Solution
Best Results



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



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.





SC

Short cycle (SC) 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 (max. 100 ms). The short cycle drawn arc stud welding is very suitable for stud diameters up to 16 mm on thin metal sheets.

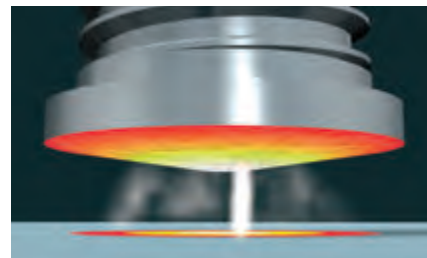
Also without shielding gas

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 aluminium. To achieve a high welding quality, use of shielding gas is recommended.



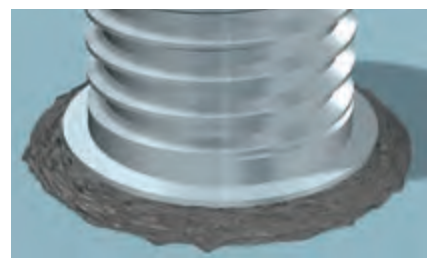
Joining of stud-type welding elements with a diameter 2 to 16 mm onto thin sheets, min. 0.5 mm. Mild steel, stainless steel and aluminium.



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
Best Results



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



With ARC and IT power units for short cycle drawn arc stud welding. (with and without shielding gas).

IT Inverter technology for drawn arc and short cycle

The first complete inverter series with welding current up to 2600 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

Dynamic regulation of the welding process through high process reliability and consistency.

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).



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

Top in:

- Outstanding welding quality – very high arc stability
- Process monitoring
- Compact, highly mobility
- Up to 100 % higher welding rate compared with conventional transformer machines



HBS EFFICIENT TECHNOLOGY



Reduces energy consumption and weight.

Increases welding quality and welding rate.

Innovative and future-oriented technology, integrated in the compact and very mobile inverter power units from HBS.

HBS inverter technology means:

- Maximum** welding quality
- Maximum** welding rates
- Minimum** energy consumption
- Minimum** weight
- Maximum** efficiency



Quality

Best welding quality through extremely high stability of the arc, even at weak welding currents or large fluctuations of the mains voltage.



Welding rates

Highest welding rates – increased by 100 % compared to standard conventional transformer technology.



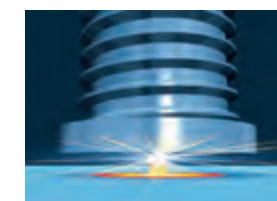
Energy consumption

Minimized energy consumption – energy needed is reduced by 50 % compared to standard power units with transformer technology.



Weight

Minimized weight – inverter technology reduces the weight by 50 % compared to power units with transformer technology.



Degree of efficiency

Maximum degree of efficiency – innovative inverter technology offers best input / output ratio.



Material	Diameter	Catalogue
	M6 to M24	Welding Elements
Type RD		
Threaded stud with reduced shaft		

Material	Diameter	Catalogue
	M6 to M16	Welding Elements
Type DD		
Virtually fully threaded stud		

Material	Diameter	Catalogue
	M6 to M20	Welding Elements
Type PD		
Partially threaded stud		

Material	Diameter	Catalogue
	6 to 16 mm	Welding Elements
Type UD		
Unthreaded stud (pin)		

Material	Diameter	Catalogue
	M6/dia.10mm - M10/dia.16mm	Welding Elements
Type ID		
Stud (pin) with internal thread		

Material	Diameter	Catalogue
	10 to 25 mm	Welding Elements
Type SD		
Shear connector		

Material	Welding range	Page
	M3 to M10 (type RD) #4 to 3/8" (type RD)	44
ARC 500		
Low cost entry level, robust transformer for small stud diameters for workshops and construction sites (IP 23).		

Material	Welding range	Page
	M3 to M10 (type RD) #4 to 7/16" (type RD)	40
Visar 650		
Tough! Single phase inverter (supply voltage range 100 to 240 V). Compact, lightweight with high protection class (IP 44) for welding without shielding gas.		

Material	Welding range	Page
	M3 to M12 (type RD) #4 to 1/2" (type RD)	44
ARC 800		
Robust transformer for workshops and construction sites (IP 23).		

Material	Welding range	Page
	M3 to M16 (type RD) #4 to 5/8" (type RD)	40
IT 1002		
All-rounder for construction sites and workshops (IP 23). Precise welding results through advanced inverter technology.		

Ground cable
93-40-020

Ground cable
93-40-020

Material	Welding range	Page
	M3 to M12 #4 to 1/2"	46
A 12 with ceramic leg assembly PSC-1		
All-rounder for workshop use, small, compact gun with easy set-up. Length compensation for stable welding results.		

Material	Welding range	Page
	M3 to M12 #4 to 1/2"	46
A 12 with ceramic leg assembly PSC-1		
All-rounder for workshop use, small, compact gun with easy set-up. Length compensation for stable welding results.		

Material	Welding range	Page
	Dia. 3 to 16 mm Dia. #4 to 5/8"	47
A 16		
All-rounder for construction sites, robust gun with plunge damper and length compensation. Level on rear of gun to line studs level.		

Accessories
ARC ceramic
Page 32-35

Ceramic leg assembly PSC-2
Page 32-35

Legend	
Material	Stud-/Welding material
	Mild steel
	Stainless steel
	Aluminium

Configuration

Drawn arc stud welding with ceramic ferrule - up to M24 (dia. 25 mm) / 1"

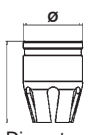
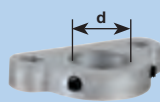
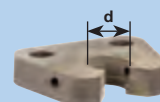











Configuration

Drawn arc stud welding with ceramic ferrule - up to M24 (dia. 25 mm) / 1"

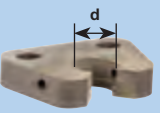
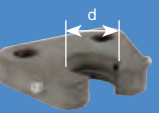
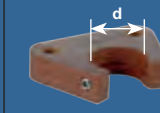
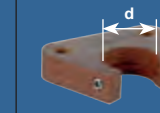
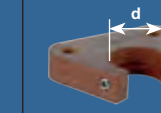






Suitable for		Chuck	Ceramic ferrule grip		Included in accessories	A 12 93-20-275 incl. leg assembly 93-40-022 (studs up to length 150 mm)	A 16 93-20-280 with leg assembly 93-40-028 (studs up to length 170 mm)	A 16 93-20-280 with leg assembly 93-40-040 (studs up to length 150 mm)	A 22 93-20-290 with leg assembly 93-40-040 (studs up to length 150 mm)	A 25 93-20-295 with leg assembly 93-40-040 (studs up to length 150 mm)	A 25 93-20-295 with leg assembly 93-40-073 (studs up to length 290 mm)
Stud type	Stud diameter	Order No.	Order No.	 Diameter		 Ø = 22 mm	 Ø = 22 mm	 Ø = 28 mm	 Ø = 28 mm	 Ø = 28 mm	 Ø = 34 mm
	M6	83-50-006	80-31-095	Ø = 22 mm	93-41-012, 93-41-016						
	M8	83-50-008	80-31-120	Ø = 22 mm	93-41-012, 93-41-016						
	M10	83-50-010	80-31-150	Ø = 22 mm	93-41-012, 93-41-016						
	M12	83-50-012	80-31-170	Ø = 22 mm	93-41-012, 93-41-016, 93-40-082						
	M16	83-50-016	80-30-116	Ø = 28 mm	93-41-016, 93-40-086						
	M20	83-50-020	80-31-262	Ø = 28 mm	93-40-042						
	M24	83-50-024	80-31-307	Ø = 34 mm	93-40-043						
	M6	83-50-006	80-31-095	Ø = 22 mm	93-41-012, 93-41-016						
	M8	83-50-008	80-31-150	Ø = 22 mm	93-41-012, 93-41-016						
	M10	83-50-010	80-31-150	Ø = 22 mm	93-41-012, 93-41-016						
	M12	83-50-012	80-31-205	Ø = 22 mm	93-41-012, 93-41-016, 93-40-082						
	M16	83-50-016	80-31-262	Ø = 28 mm	93-41-016, 93-40-081						
	M6	83-50-006	80-31-095	Ø = 22 mm	93-41-012, 93-41-016						
	M8	83-50-008	80-31-120	Ø = 22 mm	93-41-012, 93-41-016						
	M10	83-50-010	80-31-150	Ø = 22 mm	93-41-012, 93-41-016						
	M12	83-50-012	80-31-170	Ø = 22 mm	93-41-012, 93-41-016, 93-40-082						
	M16	83-50-016	80-30-116	Ø = 28 mm	93-40-086, 93-41-016						
	M20	83-50-020	80-31-262	Ø = 28 mm	93-40-042						
	4 mm*	83-50-004	80-30-104*	Ø = 22 mm							
	5 mm*	83-50-005	80-30-105*	Ø = 22 mm							
	6 mm	83-50-006	80-31-095	Ø = 22 mm	93-41-012, 93-41-016						
	8 mm	83-50-008	80-31-150	Ø = 22 mm	93-41-012, 93-41-016						
	10 mm	83-50-010	80-31-150	Ø = 22 mm	93-41-012, 93-41-016						
	12 mm	83-50-012	80-31-205	Ø = 22 mm	93-41-012, 93-41-016, 93-40-082						
	16 mm	83-50-016	80-31-262	Ø = 28 mm	93-41-016, 93-40-081						
	Ø 10 / M6	83-50-010	80-31-150	Ø = 22 mm	93-41-012, 93-41-016						
	Ø 12 / M8	83-50-012	80-31-205	Ø = 22 mm	93-41-012, 93-41-016, 93-40-082						
	Ø 16 / M10	83-50-016	80-30-262	Ø = 28 mm	93-41-016						

* Ceramic ferrule not standardised



Suitable for		Chuck	Ceramic ferrule grip			A 16 93-20-280	A 16 93-20-280	A 16 93-20-280	A 16 93-20-280	A 22 93-20-290	A 22 93-20-290	A 25 93-20-295	A 25 93-20-295	A 25 93-20-295		
Stud type	Stud diameter	Order No.	Order No.	 Diameter	Included in accessories	 d = 22 mm	 d = 28 mm			 d = 29 mm	 d = 29 mm	 d = 29 mm	 d = 29 mm	 d = 29 mm	 d = 29 mm	 d = 34 mm
	6 mm / 1/4"	83-53-006	80-30-206	D = 22 mm												
	10 mm / 3/8"	83-53-010	80-30-210	D = 22 mm												
	13 mm / 1/2"	83-53-012	80-31-213	D = 22 mm												
	13 mm / 1/2"	83-53-012	80-30-213	D = 28 mm	93-40-008											
	16 mm / 5/8" 19 mm / 5/8"	83-53-019	80-30-219	D = 29 mm	93-40-010				only Ø 16	only Ø 16						
	22 mm / 7/8"	83-53-022	80-30-222	D = 29 mm	93-40-011											
	25 mm / 1"	83-53-025	88-15-823	D = 34 mm	93-40-085											



Material	Diameter	Catalogue
	M6 to M16	Welding Elements
Type RD		
	Threaded stud with reduced shaft	

Material	Diameter	Catalogue
	M6 to M16	Welding Elements
Type DD		
	Virtually fully threaded stud	

Material	Diameter	Catalogue
	M6 to M20	Welding Elements
Type PD		
	Partially threaded stud	

Material	Diameter	Catalogue
	6 to 16 mm	Welding Elements
Type UD		
	Unthreaded stud (pin)	

Material	Diameter	Catalogue
	M6/dia.10mm - M10/dia.16mm	Welding Elements
Type ID		
	Stud (pin) with internal thread	

Material	Welding range	Page
	M3 to M12 (type RD) #4 to 1/2" (type RD)	44
	ARC 800 Robust transformer for workshops and construction sites (IP 23).	

Material	Welding range	Page
	M3 to M16 (type RD) #4 to 5/8" (type RD)	40
	IT 1002 All-rounder for construction sites and workshops (IP 23). Precise welding results through advanced inverter technology.	

Material	Welding range	Page
	M3 to M20 (type RD) #4 to 3/4" (type RD)	44
	ARC 1550 Robust transformer with step switching, power regulation and automation function.	

Material	Welding range	Page
	M3 to M24 #4 to 1"	41
	IT 2002 Energy Package for larger studs, used on construction sites and workshops.	

Ground cable
93-40-020

Ground cable
(2 pcs.)
93-40-013

Ground cable
(2 pcs.)
93-40-019

Material	Welding range	Page
	M3 to M12 #4 to 1/2"	46
	A 12 with shielding gas leg assembly PSS-2 <i>All-rounder for workshop use, small, compact gun with easy set-up.</i> Length compensation for stable welding results.	

Material	Welding range	Page
	Dia. 3 to 16 mm Dia. #4 to 5/8"	47
	A 16 <i>All-rounder for construction sites, robust gun with plunge damper and length compensation.</i> Level on rear of gun to line studs level.	

Shielding gas leg assembly
PSS-3 / Page 47

Accessories shielding gas
Page 46/47

Legend	
Material	Stud-Welding material
	Mild steel
	Stainless steel
	Aluminium

Material	Diameter	Catalogue
	M5 to M8	Welding Elements
Type PS		
Threaded stud with reduced shaft		

Material	Diameter	Catalogue
	M6 to M8	Welding Elements
Type PS		
Paint clearing stud		

Material	Diameter	Catalogue
	5 mm	Welding Elements
Type PS		
Fir Tree Stud		

Material	Diameter	Catalogue
	3 to 8 mm	Welding Elements
Type US		

Material	Diameter	Catalogue
	M3/dia.5mm - M6/dia.8mm	Welding Elements
Type IS		
Stud (pin) with internal thread		

Material	Welding range	Page
	M3 to M6 (for SC) #4 to 1/4" (for SC)	40
Visar 650		
Tough! Single phase inverter (supply voltage range 100 to 240 V). Compact, lightweight with high protection class (IP 44) for welding without shielding gas.		

Material	Welding range	Page
	M4 to M8 (for SC) #8 to 5/16" (for SC)	44
ARC 800		
Robust transformer for workshops and construction sites (IP 23).		

Material	Welding range	Page
	M3 to M10 (for SC) #4 to 7/16" (for SC)	40
IT 1002		
All-rounder for construction sites and workshops (IP 23). Precise welding results through advanced inverter technology.		

Material	Welding range	Page
	M3 to M10 (for SC) #4 to 7/16" (for SC)	42
IT 50		
Inverter (1000 A) with 4 outputs, process monitoring and shielding gas. Precise welding results through inverter technology for use with SC on thin sheets and drawn arc.		

Material	Welding range	Page
	M3 to M10 (for SC) #4 to 7/16" (for SC)	42
IT 90		
Inverter (2000 A) with options for 4 outputs, process monitoring and shielding gas. Precise results through inverter technology for use with SC on thin sheets and critical surfaces (e.g. galvanised) and drawn arc to stud size of 22 mm (7/8").		

Ground cable
93-40-020

Ground cable
93-40-020

Ground cable
(2 pcs.)
93-40-019

Material	Welding range	Page
	M3 to M8 (M10) (for SC) #4 to 5/16" (7/16") (for SC)	46
CA 08 with centering tube PPR-2/SC		
Low cost entry-level version used for Short Cycle welding with templates. Without length compensation and without shielding gas.		

Material	Welding range	Page
	M3 to M8 (M10) (for SC) #4 to 5/16" (7/16") (for SC)	46
A 12 with centering tube PPR-2/SC		
All-rounder for workshop use for short cycle with templates. Length compensation for stable welding results. No shielding gas protection.		

Material	Welding range	Page
	M3 to M8 (M10) (for SC) #4 to 5/16" (7/16") (for SC)	46
CA 08 with centering tube PPR-2/SC		
Low cost entry-level version used for Short Cycle welding with templates. Without length compensation and without shielding gas.		

Material	Welding range	Page
	M3 to M8 (M10) (for SC) #4 to 5/16" (7/16") (for SC)	46
CA 08 with gas shroud PSS-1/SC		
Low cost entry-level version used for Short Cycle welding with templates. Without length compensation. With shielding gas.		

Material	Welding range	Page
	M3 to M8 (M10) (for SC) #4 to 5/16" (7/16") (for SC)	46
A 12 with centering tube PPR-2/SC		
All-rounder for workshop use for short cycle with templates. Length compensation for stable welding results. No shielding gas protection.		

Material	Welding range	Page
	M3 to M8 (M10) (for SC) #4 to 5/16" (7/16") (for SC)	46
A 12 with gas shroud PSS-1/SC		
All-rounder for workshop use for short cycle with templates. Length compensation for stable welding results. With shielding gas protection.		

Material	Welding range	Page
	M3 to M10 (for SC) #4 to 7/16" (for SC)	46
A 12 with gas shroud PSS-2		
All-rounder for workshop use, small, compact gun with easy set-up. Length compensation for stable welding results. Preferably stud length from 40 mm (1 1/2") with diameter greater than 8 mm (5/16").		

Accessories
Page 46

Accessories
Page 46

Legend	
Material	Stud-Welding material
	Mild steel
	Stainless steel
	Aluminium



- Inverter technology
- Outstanding welding quality
- Extremely stable arc

Visar 650



- Tough! Single phase inverter (supply voltage range 100 to 240 V)
- Compact, lightweight with high protection class (IP 44)

M3 to M10 (type RD)
#4 to 7/16" (type RD)



IT 1002



- All-rounder for construction sites and workshops (IP 23)
- Precise results through advanced inverter technology

M3 to M16 (type RD)
#4 to 5/8" (type RD)



Welding process	ARC, SC	ARC, SC
Welding material		
Technology	Inverter	Inverter
Equipment		
Welding with ceramic ferrule	X	X
Welding with shielding gas	--	X
Process control	--	(optional)
Display	--	Digital
Welding range	ARC: M3 to M10 (type RD), dia. 2 to 8 mm / #4 to 7/16" (type RD), dia. 14 ga to 5/16" SC: M3 to M6, dia. 2 to 6 mm / #4 to 1/4", dia. 14 ga to 1/4"	M3 to M16 (type RD), dia. 2 to 14 mm / #4 to 5/8" (type RD), dia. 14 ga to 9/16"
Welding rate	M3 / #4 = 40 studs/min M8 / 5/16" = 12 studs/min	M12 / 1/2" = 25 studs/min
Welding current	650 A (max.)	1000 A (max.)
Current adjustment range	100 to 650 A	100 to 1000 A, electrode 50 to 400 A (stepless)
Welding time	5 to 200 ms (stepless)	5 to 1000 ms (stepless)
Primary power	100 to 240 V, 1 phase, 50/60 Hz, 16 AT (slow blow)	400 V*, 3 phases, 50/60 Hz, 35 AT (slow blow) *alternative primary power see „Order No.“
Primary plug	16 A, 2-pin grounded safety plug (plug type F ; CEE 7/4)	32 A (with 400 V mains)
Connected load	3 kVA	50 kVA (with 400 V mains)
Cooling type	F (temperature controlled cooling fan)	F (temperature controlled cooling fan)
IP Code	IP 44	IP 23
Dimension LxWxH (without handle)	474 x 337 x 351 mm / 18.66" x 13.27" x 13.82"	660 x 280 x 340 mm / 26" x 11" x 13.4"
Weight	18 kg / 39.68 lbs	31 kg / 68.343 lbs
Suitable guns	A 12 (welding cable not possible to extend), AI 06	A 12, A 16, AI 06, CA 08

Order No.

93-60-0650 (Plug E+F; Europe + China),
93-66-0650 (Plug B; USA, Kanada + China)

93-40-020 (Ground cable, 5 m, 25 mm², 2 vice grips 10")

88-24-466 (Toolbag)
(accessories and welding gun not included)



Legend

Welding process: ARC = Drawn arc stud welding, SC = Short cycle stud welding

Mild steel Stainless steel Aluminium

IT 2002



- Energy Package for larger studs, used on construction sites and workshops

M3 to M24
#4 to 1"



IT 3002



- Heavy Duty Inverter for larger studs and shear connectors
- Precise welding results through inverter even with longer cables

M3 to M24 (dia. 25 mm)
#4 to 1"



IT 130



- Heavy Duty Inverter for larger studs and shear connectors
- Process control

M3 to M24 (dia. 25 mm)
#4 to 1"



Welding process	ARC, SC	ARC, SC	ARC, SC
Welding material			
Technology	Inverter	Inverter	Inverter
Equipment			
Welding with ceramic ferrule	X (optional)	X	X
Welding with shielding gas	--	--	X
Process control	--	--	X
Display	Digital	Digital	Digital
Welding range	M3 to M24, dia. 2 to 22 mm / #4 to 1", dia. 14 ga to 1" Dia. 22 / 7/8" = 6 studs/min	M3 to M24, dia. 2 to 25 mm / #4 to 1", dia. 14 ga to 1" Dia. 25 / 1" = 6 studs/min	M3 to M24, dia. 2 to 25 mm / #4 to 1", dia. 14 ga to 1" Dia. 25 / 1" = 6 studs/min
Welding rate	2000 A (max.)	2600 A (max.)	2500 A (max.)
Welding current	300 to 2000 A (stepless)	300 to 2600 A (stepless)	300 to 2500 A (stepless)
Welding time	5 to 1500 ms (stepless)	5 to 1500 ms (stepless)	5 to 1500 ms (stepless)
Primary power	400 V*, 3 phases, 50/60 Hz, 63 AT (slow blow)	400 V*, 3 phases, 50/60 Hz, 63 AT (slow blow) at 2 studs/min dia. 25 mm (more than 2 studs/min 125 AT (slow blow))	400 V*, 3 phases, 50/60 Hz, 63 AT (slow blow)
Primary plug	*alternative primary power see „Order No.“ 63 A (with 400 V mains)	*alternative primary power see „Order No.“ 63 A (with 400 V mains)	*alternative primary power see „Order No.“ 63 A (with 400 V mains)
Connected load	100 kVA (with 400 V mains)	150 kVA (with 400 V mains)	150 kVA (with 400 V mains)
Cooling type	F (temperature controlled cooling fan)	F (temperature controlled cooling fan)	F (temperature controlled cooling fan)
IP Code	IP 23	IP 23	IP 21
Dimension LxWxH (without handle)	600 x 500 x 830 mm / 23.6" x 19.7" x 32.7"	650 x 560 x 1290 mm / 25.6" x 22" x 50.8"	650 x 560 x 1290 mm / 25.6" x 22" x 50.8"
Weight	95 kg / 209.4 lbs	170 kg / 374.786 lbs (93-60-3211) 183 kg / 403.446 lbs (93-60-3221)	168 kg / 370.38 lbs
Suitable guns	A 12, A 16, A 22, A 25, AI 06	A 12, A 16, A 22, A 25, AI 06	A 12, A 16, A 22, A 25, AI 06

Order No.

93-60-2201 (400 V)
93-66-2201 (480/460 V)
93-60-2202 (Gas, 400 V)
93-66-2202 (Gas, 480/460 V)

93-40-019 (Ground cable, 2 pcs., 5 m, 70 mm², 1 vice grip 10")

Order No.

93-60-3211 (400 V)
93-66-3211 (480/460 V)
93-60-3221 (400 V, 2 gun conn.)
93-66-3221 (480/460 V, 2 gun conn.)

93-40-080 (Ground cable, 2 pcs., 5 m, 120 mm², 1 vice grip 10")

Order No.

93-60-12133 (400 V)
93-66-12133 (480/460 V)

93-40-072 (Ground cable, 2 pcs., 5 m, 95 mm², 1 vice grip 10")

Legend

Welding process: ARC = Drawn arc stud welding, SC = Short cycle stud welding

Mild steel Stainless steel Aluminium

1 or 4 gun connections

IT 50



- Inverter (1000 A) with 4 outputs, process monitoring and shielding gas
- Precise welding results through inverter technology for use with SC on thin sheets and drawn arc

M3 to M16 (type RD)
#4 to 5/8" (type RD)



IT 90



- Inverter (2000 A) with options for 4 outputs, process monitoring and shielding gas
- Inverter for use with SC on thin sheets and critical surfaces (e.g. galvanised) and drawn arc

M3 to M24
#4 to 1"



Welding process	ARC, SC
Welding material	
Technology	Inverter
Equipment	
Welding with ceramic ferrule	X
Welding with shielding gas	X
Process control	X
Automation	X
4 gun/head connections	X
Display	Digital
Welding range	M3 to M16 (type RD), dia. 2 to 14 mm / #4 to 5/8" (type RD), dia. 14 ga to 9/16"
Welding rate	M12 / 1/2" = 25 studs/min
Welding current	1000 A (max.)
Current adjustment range	100 to 1000 A (stepless)
Welding time	5 to 1000 ms (stepless)
Primary power	400 V*, 3 phases, 50/60 Hz, 35 AT (slow blow) *alternative primary power see „Order No.“ 32 A (with 400 V mains)
Primary plug	32 A (with 400 V mains)
Connected load	50 kVA (with 400 V mains)
Cooling type	F (temperature controlled cooling fan)
IP Code	IP 21
Dimension LxWxH (without handle)	650 x 560 x 1290 mm / 25.6" x 22" x 50.8"
Weight	145 kg / 319.67 lbs
Suitable guns	A 12, A 16, AI 06

Welding process	ARC, SC
Welding material	
Technology	Inverter
Equipment	
Welding with ceramic ferrule	X
Welding with shielding gas	X
Process control	X
Automation	X
4 gun/head connections	(optional)
Display	Digital
Welding range	M3 to M24, dia. 2 to 22 mm / #4 to 1", dia. 14 ga to 7/8"
Welding rate	Dia. 22 / 7/8" = 6 studs/min
Welding current	2000 A (max.)
Current adjustment range	5 to 1500 A (stepless)
Welding time	5 to 1500 ms (stepless)
Primary power	400 V*, 3 phases, 50/60 Hz, 63 AT (slow blow) *alternative primary power see „Order No.“ 63 A (with 400 V mains)
Primary plug	63 A (with 400 V mains)
Connected load	100 kVA (with 400 V mains)
Cooling type	F (temperature controlled cooling fan)
IP Code	IP 21
Dimension LxWxH (without handle)	650 x 560 x 1290 mm / 25.6" x 22" x 50.8"
Weight	145 kg / 319.67 lbs (1 gun conn.) 165 kg / 363.76 lbs (4 gun conn.)
Suitable guns	A 12, A 16, A 22, A 25, AI 06

Order No.

- 93-60-42056 (400 V - 4 gun connection)
- 93-66-42056 (480/460 V - 4 gun connection)

- 93-40-020 (Ground cable, 5 m, 25 mm², 2 vice grips 10")

Order No.

- 93-60-12096 (400 V - 1 gun connection)
- 93-60-42096 (400 V - 4 gun connection)
- 93-66-12096 (480/460 V - 1 gun connection)
- 93-66-42096 (480/460 V - 4 gun connection)

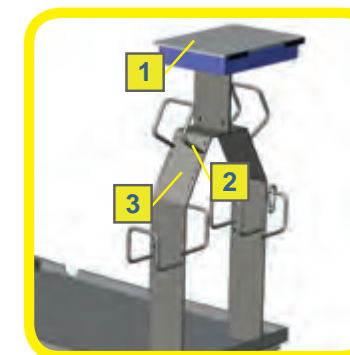
- 93-40-019 (Ground cable, 2 pcs., 5 m, 70 mm², 1 vice grip 10")

Legend Welding process: ARC = Drawn arc stud welding, SC = Short cycle stud welding

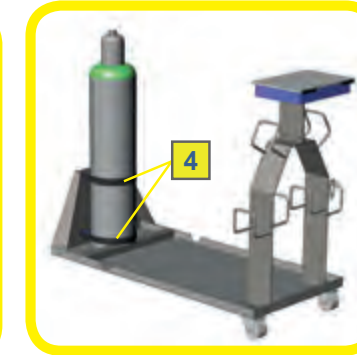
Mild steel Stainless steel Aluminium

IT Mobility System

Practical, mobile, efficient
Order no. 88-21-510 (customisation done at HBS)



1) Practical small storage box



4) Secure stands for gas cylinders

2) 4 mounts for stud welding guns and 2 mounts for ground cables

3) Flexible adjustment options for cable mounts

Maximum mobility

All devices and materials necessary for welding neatly combined in one mobile workstation.

Easily stored and always ready

Neatly arranged mountings for stud welding guns and ground cables take all the hassle out of welding. Makes your working day more efficient.

Time-consuming tangled cables are a thing of the past.

Flexible array

You can arrange the cable mounts as you wish.

Practical work aid

Logically organised small storage box for welding elements and accessories.

Secure stands for gas cylinders

Safety first. Which is why we secure the gas cylinders with two retainers.

For gas cylinders up to max. of 20 L.

Sturdy design

System integrated in machine frame of stud welding unit.

- Basic model
- Simple operation
- Welding time steplessly adjustable

ARC 500



- Low cost entry level, robust transformer for small stud diameters for workshops and construction sites (IP 23)

M3 to M10 (type RD)
#4 to 3/8" (type RD)



ARC 800



- Robust transformer for workshops and construction sites (IP 23)
- Automation (optional)

M3 to M12 (type RD)
#4 to 1/2" (type RD)



ARC 1550



- For construction sites and workshops (IP 23)
- Robust transformer with step switching and power regulation

M3 to M20 (type RD)
#4 to 3/4" (type RD)



Welding process	ARC, SC	ARC, SC	ARC, SC
Welding material			
Technology	Transformer	Transformer	Transformer
Equipment			
Welding with ceramic ferrule	X	X	X
Welding with shielding gas	--	X	X
Automation	--	X (optional)	X (optional)
Display	Digital	Digital	Digital
Welding range	M3 to M10 (type RD), dia. 2 to 8 mm / #4 to 3/8" (type RD), dia. #2 to 5/16"	M3 to M12 (type RD), dia. 2 to 10 mm / #4 to 1/2" (type RD), dia. 14 ga to 3/8"	M3 to M20 (type RD), dia. 2 to 19 mm / #4 to 3/4" (type RD), dia. 14 ga to 3/4"
Welding rate	5 to 15 studs/min (depending on application and stud dia.)	7 to 17 studs/min (depending on application and stud dia.)	3 to 35 studs/min (depending on application and stud dia.)
Welding current	580 A	800 A	1550 A
Current adjustment range	--	--	500 to 1550 A (500 A - 800 A - 1000 A - 1200 A - 1550 A)
Welding time	5 to 350 ms (stepless)	5 to 1000 ms (stepless)	5 to 1500 ms (stepless)
Primary power	400 V*, 3 phases, 50/60 Hz, 35 AT (slow blow) *alternative primary power see „Order No.“	400 V*, 3 phases, 50/60 Hz, 35 AT (slow blow) *alternative primary power see „Order No.“	400 V*, 3 phases, 50/60 Hz, 63 AT (slow blow) *alternative primary power see „Order No.“
Primary plug	32 A (at 400 V mains)	32 A (at 400 V mains)	63 A (at 400 V mains)
Connected load	I _{max} = 27A	I _{max} = 31A	40 kVA (at 400 V mains)
Cooling type	F (temperature controlled cooling fan)	F (temperature controlled cooling fan)	F (temperature controlled cooling fan)
IP Code	IP 23	IP 23	IP 23
Dimension LxWxH (without handle)	470 x 230 x 220 mm / 18.50" x 9.06" x 8.66"	470 x 230 x 220 mm / 18.50" x 9.06" x 8.66"	460 x 400 x 730 mm / 18.11" x 15.74" x 28.74"
Weight	33.5 kg / 73.855 lbs	40 kg / 88.185 lbs	133 kg / 293.21 lbs
Suitable guns	A 12, A 16, AI 06, CA 08	A 12, A 16, AI 06, CA 08	A 12, A 16, A 22, AI 06

Order No.	Order No.	Order No.
93-10-0401A (400 V)	93-10-0702A (400 V)	93-10-1552A (400 V)
93-16-0401A (230/460 V)	93-16-0702A (230/460 V)	93-16-1552A (460 V)
93-15-0401A (575 V)	93-15-0702A (575 V)	
93-40-020 (Ground cable, 5 m, 25 mm ² , 2 vice grips 10")	93-40-020 (Ground cable, 5 m, 25 mm ² , 2 vice grips 10")	93-40-013 (Ground cable, 2 pcs., 5 m, 50 mm ² , 1 vice grip 10")

Legend Welding process: ARC = Drawn arc stud welding, SC = Short cycle stud welding
 Mild steel Stainless steel

ARC 500/800

Simple operation



Two-button operation

Fast set-up with intuitive operation helps to get started.

ARC 1550

Welding current/Multiple-contact switch

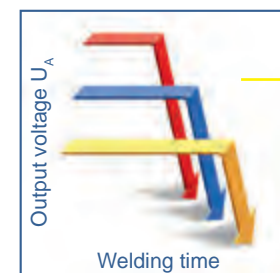


Multiple-contact switch

Adjustable: 500 / 800 / 1000 / 1200 / 1550 A

More targeted adjustment of the welding process: adjustment of the welding energy via fixed current characteristics and variable welding time.

Energy control



Guarantees consistent welding results: the welding time is automatically adjusted and thereby facilitates a stable energy output.

- U_A too high - welding time will be reduced
- Referenz weld
- U_A too low - welding time will be extended



- AI 06**
 - For ARC insulation pins
 - Dia. 3 to 6 mm
 - Dia. #4 to 1/4"
- CA 08**
 - Entry-level version used for SC welding without length compensation
 - M3 to M8 (M10)
 - #4 to 5/16" (7/16")
- A 12**
 - Compact gun with easy set-up
 - Length compensation (stable welding results)
 - M3 to M12
 - #4 to 1/2"
- A 12**
 - Small gun with easy set-up for SC welding
 - Length compensation (stable welding results)
 - M3 to M8 (M10)
 - #4 to 5/16" (7/16")

Suitable stud welding unit	ARC 500, ARC 800, IT 1002	ARC 500, ARC 800, IT 1002	ARC 500, ARC 800, ARC 1550, IT 1002, IT 2002, IT 3002, IT 50, IT 90, IT 130	ARC 800, IT 1002, IT 50, IT 90, IT 130
Welding process	ARC (ceramic, gas), SC	SC	ARC (ceramic, gas), SC	ARC (ceramic, gas), SC
Stud material				
Welding range	ARC ISO pins dia. 3 to 6 mm / dia. #4 to 1/4"	M3 to M8 (M10 with special equipment), dia. 2 to 8 mm / #4 to 5/16" (7/16" with special equipment), dia. 14 ga to 5/16"	M3 to M12, dia. 2 to 12 mm / #4 to 1/2", dia. 14 ga to 1/2"	M3 to M8 (M10 with special equipment), dia. 2 to 8 mm / #4 to 5/16" (7/16" with special equipment), dia. 14 ga to 5/16"
Stud length	10 to 400 mm / 0.39" to 15.74" (depending on leg assembly)	6 to 40 mm / 0.24" to 1.57", longer studs with optional accessories	10 to 400 mm / 0.39" to 15.74" (depending on leg assembly)	6 to 40 mm / 0.24" to 1.57", longer studs with optional accessories
Stud type	ARC insulation pin, ARC fiberfix pin, ARC threaded stud, ARC pin	Any type or shape (special chucks if required)	Any type or shape (special chucks if required)	Any type or shape (special chucks if required)
Length compensation	3 mm / 0.12" automatic	--	3 mm / 0.12" automatic	3 mm / 0.12" automatic
Stroke	Adjustment range 3 mm / 0.12", lockable	Adjustment range 4.5 mm / 0.18", lockable	Adjustment range 3 mm / 0.12", lockable	Adjustment range 3 mm / 0.12", lockable
Spring pressure	Adjustable, arresting	Adjustable, arresting	Adjustable, arresting	Adjustable, arresting
Welding cable	9,3 m / 30.51', 35 mm ² , SK 50	3 m / 9.84', 25 mm ² , SK 50	4,8 m / 15.75', 35 mm ² , SK 50	4,8 m / 15.75', 35 mm ² , SK 50
IP Code	IP 20	IP 20	IP 20	IP 20
Workplace noise level	Up to 90 dB (A) may occur during welding	Up to 90 dB (A) may occur during welding	Up to 90 dB (A) may occur during welding	Up to 90 dB (A) may occur during welding
Dimension LxWxH (without cable)	180 x 65 x 140 mm / 7.09" x 2.56" x 5.51"	190 x 40 x 140 mm / 7.48" x 1.57" x 5.51"	200 x 65 x 140 mm / 7.87" x 2.56" x 5.51" (with foot piece)	190 x 40 x 140 mm / 7.48" x 1.57" x 5.51"
Weight (without cable)	0.8 kg / 1.76 lbs	0.7 kg / 1.54 lbs	0.8 kg / 1.76 lbs	0.8 kg / 1.76 lbs

Order No.	Order No.	Order No.	Order No.
93-20-250 (excluding leg assembly)	¹⁾ 92-20-281 (PPR-2/SC) ²⁾ 92-20-283 (PSS-1/SC)	³⁾ 93-20-274 (Gas) ⁴⁾ 93-20-275 (Ceramic)	⁵⁾ 93-20-276 (PPR-2/SC) ⁶⁾ 93-20-277 (PSS-1/SC)
93-40-044 (leg assembly PSI, from l = 6 mm up to l = 80 mm) 93-40-066 (leg assembly PSI-3, from l = 40 mm up to l = 280 mm) 93-40-065 (leg assembly PSI-3, from l = 40 mm up to l = 460 mm)	92-40-018 (Accessories CD M3 to M8)	93-40-114 (Accessories for shielding gas; M6 to M12) 93-41-012 (Accessories for ceramic; M6 to M12)	92-40-018 (Accessories CD M3 to M8)

Legend Welding process: ARC = Drawn arc stud welding, SC = Short cycle stud welding
 Mild steel Stainless steel Aluminium



- A 16**
 - All-rounder for construction sites
 - Robust gun with plunge damper and length compensation
 - Dia. 3 to 16 mm
 - Dia. #4 to 5/8"
- A 22**
 - Heavy duty gun for construction sites
 - Robust gun with plunge damper and length compensation
 - Dia. 14 to 22 mm (25 mm)
 - Dia. 9/16" to 7/8" (1")
- A 25**
 - Especially for 1" shear connectors and through deck welding
 - Robust gun with plunge damper and length compensation
 - Dia. 14 to 25 mm
 - Dia. 9/16" to 1"

Suitable stud welding unit	ARC 500, ARC 800, ARC 1550, IT 1002, IT 2002, IT 3002, IT 50, IT 90, IT 130	ARC 1550, IT 2002, IT 3002, IT 90, IT 130	IT 2002, IT 3002, IT 130
Welding process	ARC (ceramic, gas), SC	ARC (ceramic)	ARC (ceramic)
Stud material			
Welding range	Dia. 3 to 16 mm / dia. #4 to 5/8"	Dia. 14 to 22 mm (dia. 25 mm) / dia. 9/16" to 7/8" (dia. 1")	Dia. 14 to 25 mm / dia. 9/16" to 1"
Stud length	10 to 240 mm / 0.39" to 9.45" (depending on leg assembly)	10 to 390 mm / 0.39" to 15.35" (depending on leg assembly)	10 to 390 mm / 0.39" to 15.35" (depending on leg assembly)
Stud type	Any type or shape (special chucks if required)	Any type or shape (special chucks if required)	Any type or shape (special chucks if required)
Length compensation	6 mm / 0.24" automatic	9 mm / 0.35" automatic	9 mm / 0.35" automatic
Stroke	Adjustment range 4 mm / 0.16", (0.25 mm / 0.01" steps, arresting)	Adjustment range 6 mm / 0.24", (0.25 mm / 0.01" steps, arresting)	Adjustment range 6 mm / 0.24", (0.25 mm / 0.01" steps, arresting)
Spring pressure	Adjustable oildamper	Adjustable oildamper	Adjustable oildamper
Welding cable	4.8 m / 15.75', 50 mm ² / 1/0, SK 50	4.8 m / 15.75', 95 mm ² / 3/0, SKK 95	1.1 m / 3.61', 120 mm ² / 4/0, SKS 120
IP Code	IP 20	IP 20	IP 20
Workplace noise level	Up to 90 dB (A) may occur during welding	Up to 90 dB (A) may occur during welding	Up to 90 dB (A) may occur during welding
Dimension LxWxH (without cable, with foot piece)	260 x 74 x 220 mm / 10.24" x 2.91" x 8.66"	260 x 74 x 220 mm / 10.24" x 2.91" x 8.66"	260 x 74 x 220 mm / 10.24" x 2.91" x 8.66"
Weight (without cable)	2 kg / 4.41 lbs	2 kg / 4.41 lbs	2 kg / 4.41 lbs

Order No.	Order No.	Order No.
93-20-280 (excluding leg assembly)	93-20-290 (excluding leg assembly)	93-20-295 (excluding leg assembly)
Ceramic Accessories for ceramic see page 32-35	Ceramic Accessories for ceramic see page 32-35	Ceramic Accessories for ceramic see page 32-35
Gas 93-40-084 (Accessories for shielding gas; M12) 93-40-017 (Shielding gas leg assembly)		

Legend Welding process: ARC = Drawn arc stud welding, SC = Short cycle stud welding
 Mild steel Stainless steel



MARC

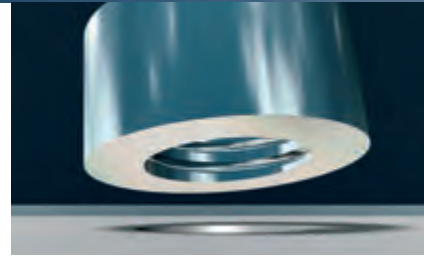
Innovative ARC welding technique

HBS presents MARC, a manual nut welding system which is more and more replacing traditional processes all over the world due to the innovative procedure with a magnetic rotating ARC.

Regardless of whether only static stability is required or if additional, customerspecific connection properties (e.g., pressure tight) need to be fulfilled, you always achieve the best results – with considerable time and cost savings.

Spatter free joints can be achieved with a high welding cycle time of up to 10 welds/minute. This is especially suited for thin metal sheets from 1 mm upwards.

MARC provides the access to a new future to international trusts, medium-sized companies as well as to crafts enterprise.



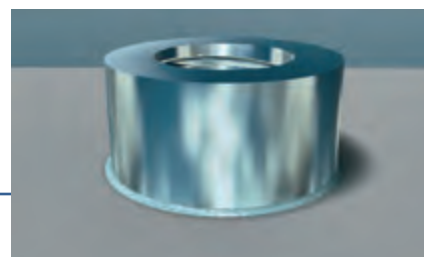
Joining of welding elements



A burning ARC is put into rotation in a controlled way. A ring-shaped weld pool is generated where the welding element is plunged in.



The very precise and clean welding process does not require any subsequent machining of the work piece or welding element (e.g. caused by distortion or welding spatters at the thread).



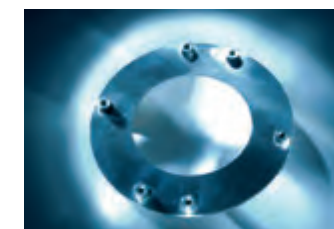
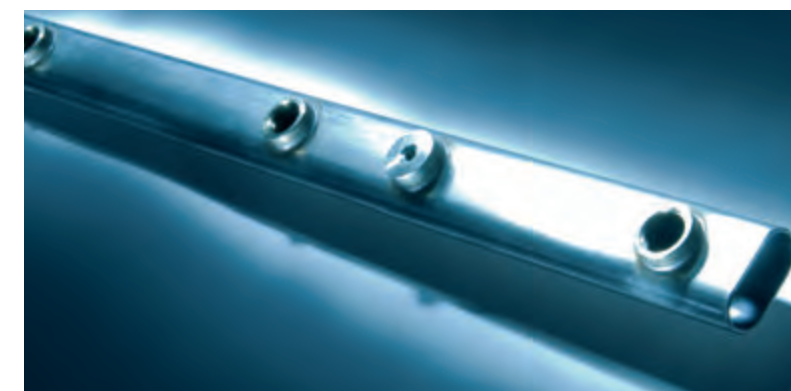
The molten areas solidify. The short and clean welding process does not require any machining.

Based on a very short welding time and low energy consumption, extraordinary welding results are achieved featured by high process stability and best economical efficiency.

Optimum results, efficiency and a convincing price/performance ratio provide advantages with view to competition.



MARC
Best Solution
for Best Results



With MARC:
Welding of pads and nuts on punched and unpunched metal sheets.

Applications are e.g. sprinkler systems, ventilation tubes, hinges, pressure vessels, exhaust systems.





- One sided access only
- Self-centring welding nut (on hole)
- No weld spatter in thread

MARC 1 A



Nut welding gun
AM 12 A

Welding unit
IT 1002

- For welding of welding nuts of type HexNut
- For welding on perforated and unperforated metal sheets
- Especially suitable for workshop and assembly area
- Up to 4 welding nuts/min

HexNut
M6 - M12



AM 12 A

Suitable stud welding unit	IT 1002 (see page 40)
Welding process	Magnetic rotating arc
Welding range	Welding nuts of type HexNut M6 - M12
Wall thickness	1 to 3 mm / 0.04" to 0.12" (other sheet thicknesses on request)
Welding element material	A2-50
Welding element type	MARC welding nut - type HexNut
Welding rate	Up to 4 welding nuts/min. The maximum welding sequence is limited by a number of parameters.
Length compensation	3 / 0.12" mm, automatic
Stroke	Adjustment range 3 / 0.12" mm, lockable
Spring pressure	Adjustable, arresting
Welding cable	5 m / 16.40'
IP-Code	IP 20
Workplace noise level	Up to 90 dB (A) may occur during welding
Dimension LxWxH	320 x 70 x 200 mm / 12.60" x 2.76" x 7.87" (without cable, with leg assembly)
Weight	0.9 kg / 1.98 lbs (without cable)

Order No.

- 93-20-242 (Welding gun AM 12 A)
 93-60-1202 (Welding unit IT 1002)
 93-40-020 (Ground cable, 5 m, 25 mm²; 2 vice grips 10")

- Complete equipment for AM 12 A:
 93-40-0030068 for HexNut M
 93-40-003008 for HexNut M8
 93-40-003010 for HexNut M10
 93-40-003012 for HexNut M12

Dimensions of welding element					
Dimension		M6	M8	M10	M12
Height - HexNut		8	8	9	11
WAF		WAF 14	WAF 14	WAF 17	WAF 19
Bore diameter	Bore diameter - metal sheet (based on DIN EN ISO 4032)	10.6 ^{+0.1...+0.4}	10.6 ^{+0.1...+0.4}	12.6 ^{+0.1...+0.4}	14.9 ^{+0.1...+0.4}
Tightening torque	Tightening torque in Nm (μ=0.18)	3.8	9.5	19.0	33.0

MARC 1 W



Nut welding gun
AM 12 W

Welding unit
IT 1002

Cooling unit
CU

- Water-cooled field former for higher welding sequences
- 250% higher welding rate (compared to MARC 1 A)
- Up to 10 welding nuts/min.

HexNut
M6 - M12



AM 12 W

Suitable stud welding unit	IT 1002 (see page 40)
Welding process	Magnetic rotating arc
Welding range	Welding nuts of type HexNut M6 - M12
Wall thickness	1 to 3 mm (other sheet thicknesses on request)
Welding element material	A2-50
Welding element type	MARC welding nut - type HexNut
Welding rate	Up to 10 welding nuts/min. The maximum welding sequence is limited by a number of parameters.
Length compensation	3 / 0.12" mm, automatic
Stroke	Adjustment range 3 / 0.12" mm, lockable
Spring pressure	Adjustable, arresting
Welding cable	5 m / 16.40'
IP-Code	IP 20
Workplace noise level	Up to 90 dB (A) may occur during welding
Dimension LxWxH	320 x 70 x 200 mm / 12.60" x 2.76" x 7.87" (without cable, with leg assembly)
Weight	0.9 kg / 1.98 lbs (without cable)

Order No.

- 93-20-243 (Welding gun AM 12 W)
 93-60-1202 (Welding unit IT 1002)
 88-15-477A (Cooling unit CU)
 93-40-020 (Ground cable, 5 m, 25 mm²; 2 vice grips 10")

- Complete equipment for AM 12 W:
 93-40-0030068 for HexNut M6
 93-40-003008 for HexNut M8
 93-40-003010 for HexNut M10
 93-40-003012 for HexNut M12



CU

Pump type	Diaphragm pump, Qmax = 2 l/min / delivery head Hmax = 2.5 m
Coolant	GLYSANTIN Alu Protect/Water, Safety precaution: Coolant is dangerous to health if swallowed!
Tank capacity	4.5 l for replacement filling with coolant composition above
Flow rate sensor	Switching point < 0.5 l/min
Primary power	230 V, 50/60 Hz, 10 AT
IP-Code	IP 23
Dimension LxWxH	660 x 220 x 340 mm (without handle)
Weight	24 kg (incl. coolant)

Order No.

- 88-15-477A (Cooling unit CU)

PC-M3



- The most effective as well as most economical welding procedure for the welding hollow cylindrical parts
- Closed and pressure sealed weld all-over
- For gas tight connections like e.g. at exhaust systems
- Energy controlled welding system

Min. dia. 8 mm, max. dia. 32 mm
or internal thread M4 to M18



Welding range	Min. dia. 8 mm, max. dia. 32 mm or internal thread M4 to M18 Min. dia. 5/16", max. dia. 1.26" or internal thread #8 to 0.71"
Height of nut	Min. 4 mm, max. 30 mm Min. 0.16", max. 1.18"
Welding material	Weldable, high and low alloys, mild steel
Welding rate	Depending on dia. 12 pieces/min (dia. 28, dia. 1.10" approx. 2 to 4 pieces/min)
Welding current	300 to 1000 A stepless remote controllable
Welding time	5 to 2000 ms stepless remote controllable
Primary power	400 V (480 V), 16 A
Gas connection	Series
Air pressure connection	6 bar/inner hose dia. 6 mm, dia. 1/4"
Power source	Inverter
Controller	CEL M440, 186 GHz
Programming modes	Welding current, welding time, any motion profile, welding piston, shielding gas, fully controlled and tempered magnetic field former
Welding head	Linearmotor driven
Field former unit	Tempered
Pneumatic work stroke	120 mm, 4.72"
Height adjustment	250 mm, 9.84"

Order No.

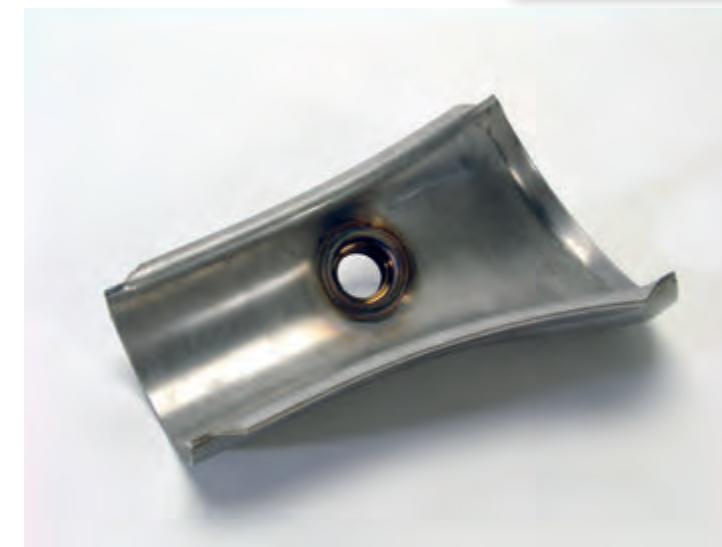
According to project



The most innovative process for welding nut type elements

Best Solution for Best Results

To be used for nearly any application in metal working industry: The very low heat input avoids any distortion of the work piece and you get a perfect gas-tight weld with high and dynamic loading capacity.



Recommended material: Stainless steel (1.4301, AISI 304 and similar)

Very short welding time (≤ 1 second) and consequently short cycle time in production ensures high productivity together with low manufacturing costs.

Extremely clean process.

Small and even circulating welding seam.

Only one-sided accessibility to the work piece required.

No reworking of work piece or welding element (thread).

No welding additives required (only shielding gas).



Automatically faster, better



Material	Diameter	Catalogue
	M3 to M10	Welding Elements
Type PT		
Threaded stud		

Material	Diameter	Catalogue
	M4 to M8	Welding Elements
Type PT		
Paint clearing threaded stud		

Material	Diameter	Catalogue
	5 mm	Welding Elements
Type PT		
Fir tree stud		

Material	Diameter	Catalogue
	3 to 7,1 mm	Welding Elements
Type UT		
Unthreaded stud (pin)		

Material	Diameter	Catalogue
	M3/dia.5mm - M5/dia.7,1mm	Welding Elements
Type IT		
Stud (pin) with internal thread		

Material	Welding range	Page
	M3 to M8 #4 to 5/16"	63
CDi 1502		
Entry level automation for semi automatic use. Simple library function for ease of use.		

Material	Welding range	Page
	M3 to M8 (M10) #4 to 5/16" (7/16")	63
CDMi 2402		
All-rounder for automation. Extensive library function. Change over of capacitors for optimal energy input.		

Material	Welding range	Page
	M3 to M10 #4 to 7/16"	63
CDMi 3202		
Energy package for automation. Extensive library function. Change over of capacitors for optimal energy input.		

Ground cable
92-40-095

VBZ-3
Page 66

Material	Welding range	Page
	M3 to M8 #4 to 5/16"	67
PAH-1 with foot ring		
<i>Universal design for flat surfaces</i> Hand gun for fully automatic stud feed (with VBZ-3) or hand feed; recommended for large-scale production.		

Material	Welding range	Page
	M3 to M8 #4 to 5/16"	67
PAH-1 with centering device PZV 3 dia. 30		
<i>Used for welding with templates</i> Hand gun for fully automatic stud feed (with VBZ-3) or hand feed; recommended for large-scale production.		

Legend	
Material	Stud-/Welding material
	Mild steel
	Stainless steel
	Aluminium
	Brass

Material	Diameter	Catalogue
	M3 to M10	Welding Elements
Type PT		
	Threaded stud	

Material	Diameter	Catalogue
	M4 to M8	Welding Elements
Type PT		
	Paint clearing threaded stud	

Material	Diameter	Catalogue
	5 mm	Welding Elements
Type PT		
	Fir tree stud	

Material	Diameter	Catalogue
	3 to 7,1 mm	Welding Elements
Type UT		
	Unthreaded stud (pin)	

Material	Diameter	Catalogue
	M3/dia.5mm - M5/dia.7,1mm	Welding Elements
Type IT		
	Stud (pin) with internal thread	

Material	Welding range	Page
	M3 to M8 (M10) #4 to 5/16" (7/16")	63
	CDMi 2402 All-rounder for automation. Extensive library function. Change over of capacitors for optimal energy input.	

Material	Welding range	Page
	M3 to M10 #4 to 7/16"	63
	CDMi 3202 Energy package for automation. Extensive library function. Change over of capacitors for optimal energy input.	

Ground cable
92-40-095

Connecting line
Page 75

VBZ-3
Page 66

Ring initiator and Coupling
Page 75

Working stroke with ring initiator
Page 75

Material	Welding range	Page
	M3 to M8 #4 to 5/16"	
	KAH 412 Setting the lift and plunge via digital display (selection mm/inch). No length compensation.	

Material	Welding range	Page
	M3 to M8 #4 to 5/16"	
	KAH 412 LA Setting the lift via adjustment screw (increments 0.1 mm). Length compensation of length variances in studs height and variances of the workpiece.	

Further accessories
Page 74-75

Legend	
Material	Stud-/Welding material
	Mild steel
	Stainless steel
	Aluminium
	Brass

Material	Diameter	Catalogue
	M5 to M8	Welding Elements
Type PS		
	Threaded stud with reduced shaft	

Material	Diameter	Catalogue
	M6 to M8	Welding Elements
Type PS		
	Paint clearing stud	

Material	Diameter	Catalogue
	5 mm	Welding Elements
Type PS		
	Fir Tree Stud	

Material	Diameter	Catalogue
	3 to 8 mm	Welding Elements
Type US		
	Stud (pin) with internal thread	

Material	Diameter	Catalogue
	M3/dia.5mm - M6/dia.8mm	Welding Elements
Type IS		
	Stud (pin) with internal thread	

Material	Welding range	Page
	M3 to M10 (for SC) #4 to 7/16" (for SC)	40
IIT 1002		
	All-rounder for construction sites and workshops (IP 23). Precise welding results through advanced inverter technology.	

Material	Welding range	Page
	M3 to M10 (for SC) #4 to 7/16" (for SC)	42
IT 50		
	Inverter (1000 A) with 4 outputs, process monitoring and shielding gas. Precise welding results through inverter technology for use with SC on thin sheets and drawn arc.	

Material	Welding range	Page
	M3 to M10 (for SC) #4 to 7/16" (for SC)	42
IT 90		
	Inverter (2000 A) with options for 4 outputs, process monitoring and shielding gas. Precise results through inverter technology for use with SC on thin sheets and critical surfaces (e.g. galvanised) and drawn arc to stud size of 22 mm (7/8").	

Welding current sensor
Page 75

Ground cable
92-40-095

Connecting line
Page 75

VBZ-3
Page 66

Ring initiator and Coupling
Page 75

Working stroke with ring initiator
Page 75

Material	Welding range	Page
	M3 to M8 #4 to 5/16"	68-69
KAH 412		
	Setting the lift and plunge via digital display (selection mm/inch). No length compensation.	

Material	Welding range	Page
	M3 to M8 #4 to 5/16"	68-69
KAH 412 LA		
	Setting the lift via adjustment screw (increments 0.1 mm). Length compensation of length variances in studs height and variances of the workpiece.	

Further accessories
Page 74-75

Legend	
Material	Stud-/Welding material
	Mild steel
	Stainless steel
	Aluminium
	Brass

	Stud welding machines	Welding process	Order no.	Primary power	Charging units	Automatic	Gas	Welding gun or head connection	Process control	Emergency stop function	Remote control
	CDi 1502 M3 to M8 #4 to 5/16"	CD	92-10-1504B 92-12-1504B 92-13-1504B	230 V 115 V 100 V	--	X	--	1	--	--	--
	CDMi 2402 M3 to M8 (M10 limited) #4 to 5/16" (7/16" limited)	CD	92-10-22412B 92-12-22412B 92-13-22412B	230 V 115 V 100 V	2	X	--	1	--	--	--
	CDMi 3202 M3 to M10 #4 to 7/16"	CD	92-10-23212B 92-12-23212B 92-13-23212B	230 V 115 V 100 V	3	X	--	1	--	--	--
	ARC 800 Dia. 2 to 10 mm 14 ga to 3/8"	ARC SC	93-10-0704A 93-16-0704A 93-15-0704A 93-10-0705A	400 V 460/230 V 575 V 400 V	--	X	X	1	--	--	--
	ARC 1550 Dia. 2 to 19 mm 14 ga to 3/4"	ARC SC	93-10-1554A 93-16-1554A 93-10-1555A	400 V 460 V 400 V	--	X	--	1	--	--	--
	IT 1002 Dia. 2 mm to M16 (type RD) 14 ga to 5/8" (type RD)	ARC SC	93-60-1204 93-66-1204 93-60-1205 93-60-1206 93-66-1206 93-60-1208 93-60-1207	400 V 480/460 V 400 V 400 V 480/460 V 400 V 400 V	--	X	X	1	--	--	--
	IT 50 Dia. 2 mm to M16 (type RD) 14 ga to 5/8" (type RD)	ARC SC	93-60-42056 93-66-42056 93-60-42057	400 V 480/460 V 400 V	--	X	X	4	X	X	--
	IT 90 Dia. 2 to 22 mm 14 ga to 7/8"	ARC SC	93-60-12096 93-66-12096 93-60-12097 93-60-42096 93-66-42096 93-60-42097	400 V 480/460 V 400 V 400 V 480/460 V 400 V	--	X	X	1	X	--	--

CDi 1502



- Entry level automation for semi-automatic use
- Simple library function for ease of use

M3 to M8
#4 to 5/16"



Welding process	CD
Welding material	
Technology	Inverter-Capacitor Charging Technology
Equipment Automation	X
Display	Digital
Welding range	Studs: M3 to M8, dia. 2 to 8 mm #4 to 5/16", dia. 14 ga to 5/16"
Welding rate	M3 / #4 = 40 studs/min. (voltage 60 V) M8 / 5/16" = 14 studs/min. (voltage 200 V) M8 / 5/16" = 12 studs/min. (voltage 220 V)
Capacitance	66 000 µF
Welding time	1 to 3 ms
Energy	1 600 Ws
Charging voltage	50 to 220 V (stepless voltage regulation)
Primary power	230 V**, 50/60 Hz, 10 AT (slow blow) **alternative primary power see „Order No.“
Connected load	600 VA
Power source	Capacitor
Cooling type	F (temperature controlled cooling fan)
IP Code	IP 23
Dimension LxWxH (without handle)	400 x 205 x 250 mm / 15.75" x 8.07" x 9.84"
Weight	14 kg / 30.87 lbs
Suitable guns/heads	PAH-1

Order No.

92-10-1504B (230 V)
92-12-1504B (115 V)
92-13-1504B (100 V)

CDMi 2402



- All-rounder for automation
- Extensive library function
- Change over of capacitors for optimal energy input

M3 to M8 (M10)
#4 to 5/16" (7/16")



Welding process	CD
Welding material	
Technology	Inverter-Capacitor Charging Technology
Equipment Automation	X
Display	LCD
Welding range	M3 to M8 (M10 limited), dia. 2 to 8 mm (dia. 10 mm limited) #4 to 5/16" (7/16" limited), dia. 14 ga to 5/16" (dia. 3/8" limited)
Welding rate	M3 / #4 = 40 studs/min. (voltage 60 V) M8 / 5/16" = 21 studs/min. (voltage 140 V) (M10 / 7/16" = 17 studs/min. (voltage 210 V))
Capacitance	99 000 µF/33 000 µF* * with change over of capacitors
Welding time	1 to 3 ms
Energy	2 400 Ws/800 Ws*
Charging voltage	50 to 220 V (stepless voltage regulation)
Primary power	230 V**, 50/60 Hz, 10 AT (slow blow) **alternative primary power see „Order No.“
Connected load	1 000 VA
Power source	Capacitor
Cooling type	F (temperature controlled cooling fan)
IP Code	IP 21
Dimension LxWxH (without handle)	570 x 285 x 290 mm / 22.44" x 11.22" x 11.42"
Weight	27 kg / 59.53 lbs
Suitable guns/heads	PAH-1, KAH 412, KAH 412 LA

Order No.

92-10-22412B (230 V)
92-12-22412B (115 V)
92-13-22412B (100 V)

CDMi 3202



- Energy package for automation
- Extensive library function
- Change over of capacitors for optimal energy input

M3 to M10
#4 to 7/16"



Welding process	CD
Welding material	
Technology	Inverter-Capacitor Charging Technology
Equipment Automation	X
Display	LCD
Welding range	M3 to M10, dia. 3 to 10 mm #4 to 7/16", dia. #4 to 3/8"
Welding rate	M3 / #4 = 43 studs/min. (voltage 50 V) M8 / 5/16" = 25 studs/min. (voltage 140 V) M10 / 7/16" = 18 studs/min. (voltage 200 V)
Capacitance	132 000 µF/66 000 µF* * with change over of capacitors
Welding time	1 to 3 ms
Energy	3 200 Ws/1 600 Ws*
Charging voltage	50 to 220 V (stepless voltage regulation)
Primary power	230 V**, 50/60 Hz, 10 AT (slow blow) **alternative primary power see „Order No.“
Connected load	1 800 VA
Power source	Capacitor
Cooling type	F (temperature controlled cooling fan)
IP Code	IP 21
Dimension LxWxH (without handle)	570 x 285 x 290 mm / 22.44" x 11.22" x 11.42"
Weight	27 kg / 59.53 lbs
Suitable guns/heads	PAH-1, KAH 412, KAH 412 LA

Order No.

92-10-23212B (230 V)
92-12-23212B (115 V)
92-13-23212B (100 V)

Legend Welding process: CD = Capacitor discharge stud welding

- Mild steel
- Stainless steel
- Aluminium
- Brass



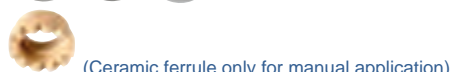
- Basic model
- Simple operation
- Welding time steplessly adjustable

ARC 800



- Robust transformer with automation function

M3 to M12 (type RD)
#4 to 1/2" (type RD)



Welding process	ARC, SC
Welding material	
Technology	Transformer
Equipment	
Welding with ceramic ferrule	X
Welding with shielding gas	X
Automation	X
Display	Digital
Welding range	Dia. 2 to 10 mm, M3 to M12 (type RD) dia. 14 ga to 3/8", #4 to 1/2"
Welding rate	7 to 17 studs/min (depending on application and stud dia.)
Welding current	800 A
Current adjustment range	--
Welding time	5 to 1000 ms (stepless)
Primary power	400 V*, 3 phases, 50/60 Hz, 35 AT (slow blow) *alternative primary power see „Order No.“ 32 A (at 400 V mains)
Primary plug	I1max = 31A
Connected load	11max = 31A
Cooling type	F (temperature controlled cooling fan)
IP Code	IP 23
Dimension LxWxH (without handle)	470 x 230 x 220 mm / 18.50" x 9.06" x 8.66"
Weight	40 kg / 88.185 lbs
Suitable guns/heads	PAH-1, KAH 412, KAH 412 LA

Order No.

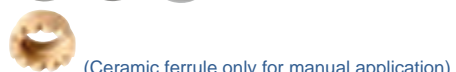
93-10-0704A (400 V)
93-16-0704A (230/460 V)
93-15-0704A (575 V)

ARC 1550



- Robust transformer with step switching, power regulation and automation function

M3 to M20 (type RD)
#4 to 3/4" (type RD)



Welding process	ARC, SC
Welding material	
Technology	Transformer
Equipment	
Welding with ceramic ferrule	X
Welding with shielding gas	X
Automation	X
Display	Digital
Welding range	Dia. 2 to 19 mm, M3 to M20 (type RD) dia. 14 ga to 3/4", #4 to 3/4"
Welding rate	3 to 35 studs/min (depending on application and stud dia.)
Welding current	1550 A
Current adjustment range	500 to 1550 A (500 A - 800 A - 1000 A - 1200 A - 1550 A)
Welding time	5 to 1500 ms (stepless)
Primary power	400 V*, 3 phases, 50/60 Hz, 63 AT (slow blow) *alternative primary power see „Order No.“ 63 A (at 400 V mains)
Primary plug	40 kVA (at 400 V mains)
Connected load	40 kVA (at 400 V mains)
Cooling type	F (temperature controlled cooling fan)
IP Code	IP 23
Dimension LxWxH (without handle)	460 x 400 x 730 mm / 18.11" x 15.74" x 28.74"
Weight	133 kg / 293.21 lbs
Suitable guns/heads	PAH-1, KAH 412, KAH 412 LA

Order No.

93-10-1554A (400 V)
93-16-1554A (460 V)

Legend Welding process: ARC = Drawn arc stud welding, SC = Short cycle stud welding

Mild steel Stainless steel

- Inverter technology
- Outstanding welding quality
- Extremely stable arc

IT 1002



- All-rounder for automation
- Precise welding results through advanced inverter technology

M3 to M16 (type RD)
#4 to 5/8" (type RD)



Welding process	ARC, SC
Welding material	
Technology	Inverter
Equipment	
Welding with ceramic ferrule	X
Welding with shielding gas	X
Process control	(optional)
Automation	X
4 gun/head connections	X
Display	Digital
Welding range	Dia. 2 to 14 mm, M3 to M16 (type RD) dia. 14 ga to 9/16", #4 to 5/8" (type RD)
Welding rate	M12 / 1/2" = 25 studs/min
Welding current	1000 A (max.)
Current adjustment range	100 to 1000 A, electrode 50 to 400 A (stepless)
Welding time	5 to 1000 ms (stepless)
Primary power	400 V*, 3 phases, 50/60 Hz, 35 AT (slow blow) *alternative primary power see „Order No.“ 32 A (with 400 V mains)
Primary plug	32 A (with 400 V mains)
Connected load	50 kVA (with 400 V mains)
Cooling type	F (temperature controlled cooling fan)
IP Code	IP 23
Dimension LxWxH (without handle)	660 x 280 x 340 mm / 26" x 11" x 13.4"
Weight	31 kg / 68.343 lbs
Suitable guns/heads	PAH-1, KAH 412, KAH 412 LA

Order No.

93-60-1204 (400 V)
93-66-1204 (480/460 V)

Legend Welding process: ARC = Drawn arc stud welding, SC = Short cycle stud welding

Mild steel Stainless steel Aluminium

IT 50



- Inverter with 4 outputs, process monitoring and shielding gas
- Precise results for use with SC on thin sheets and drawn arc

M3 to M16 (type RD)
#4 to 5/8" (type RD)



Welding process	ARC, SC
Welding material	
Technology	Inverter
Equipment	
Welding with ceramic ferrule	X
Welding with shielding gas	X
Process control	X
Automation	X
4 gun/head connections	X
Display	Digital
Welding range	Dia. 2 to 14 mm, M3 to M16 (type RD) dia. 14 ga to 9/16", #4 to 5/8" (type RD)
Welding rate	M12 / 1/2" = 25 studs/min
Welding current	1000 A (max.)
Current adjustment range	100 to 1000 A (stepless)
Welding time	5 to 1000 ms (stepless)
Primary power	400 V*, 3 phases, 50/60 Hz, 35 AT (slow blow) *alternative primary power see „Order No.“ 32 A (with 400 V mains)
Primary plug	32 A (with 400 V mains)
Connected load	50 kVA (with 400 V mains)
Cooling type	F (temperature controlled cooling fan)
IP Code	IP 21
Dimension LxWxH (without handle)	650 x 560 x 1290 mm / 25.6" x 22" x 50.8"
Weight	145 kg / 319.67 lbs
Suitable guns/heads	PAH-1, KAH 412, KAH 412 LA

Order No.

93-60-42056 (400 V - 4 gun connection)
93-66-42056 (480/460 V - 4 gun connection)

IT 90



- 4 outputs (optional), process monitoring and shielding gas
- For critical surfaces (e.g. galvanised)

M3 to M24
#4 to 1"



Welding process	ARC, SC
Welding material	
Technology	Inverter
Equipment	
Welding with ceramic ferrule	X
Welding with shielding gas	X
Process control	X
Automation	X
4 gun/head connections	(optional)
Display	Digital
Welding range	Dia. 2 to 22 mm, M3 to M24 dia. 14 ga to 7/8", #4 to 1"
Welding rate	Dia. 22 / 7/8" = 6 studs/min
Welding current	2000 A (max.)
Current adjustment range	5 to 1500 A (stepless)
Welding time	5 to 1500 ms (stepless)
Primary power	400 V*, 3 phases, 50/60 Hz, 63 AT (slow blow) *alternative primary power see „Order No.“ 63 A (at 400 V mains)
Primary plug	63 A (with 400 V mains)
Connected load	100 kVA (with 400 V mains)
Cooling type	F (temperature controlled cooling fan)
IP Code	IP 21
Dimension LxWxH (without handle)	650 x 560 x 1290 mm / 25.6" x 22" x 50.8"
Weight	145 kg / 319.67 lbs (1 gun conn.) 165 kg / 363.76 lbs (4 gun conn.)
Suitable guns/heads	PAH-1, KAH 412, KAH 412 LA

Order No.

93-60-12096 (400 V - 1 gun connection)
93-60-42096 (400 V - 4 gun connection)
93-66-12096 (480/460 V - 1 gun connection)
93-66-42096 (480/460 V - 4 gun connection)



VBZ-3



- Feeding unit VBZ-3 for automatic feeding for welding elements with flange according to current standards
- Fully automatic feeding of welding elements from dia. 3 up to 8 mm (with flange) (other dia. on request)
- Length from 8 to 50 mm
- Simple, fast change over to different welding elements (by means of quick-change system)

M3 to M8
#4 to 5/16"



Stud diameter	M3 to M8, dia. 3 to 8 mm / #4 to 5/16, dia. #4 to 5/16" (other diameter on request)
Stud length	8 to 50 mm / 0.31" to 1.97"
Feed speed	Up to 30 studs/min (depending on welding element and feeding tube)
Air pressure connection	6 bar/800 litre/min
Primary power	230 V*, 50 Hz, 0.9 A *alternative primary power see „Order No.“
IP Code	IP 20
Dimension LxWxH	470 x 310 x 280 mm / 18.50" x 12.20" x 11.02"
Weight	Approx. 24 kg / 52.91 lbs

Order No.

230 V

- 94-63-103B (for dia. 3 mm)
- 94-63-104B (for dia. 4 mm)
- 94-63-105B (for dia. 5 mm)
- 94-63-106B (for dia. 6 mm)
- 94-63-171B (for dia. 7.1 mm)
- 94-63-108B (for dia. 8 mm)
- 94-63-153B (for fir tree stud dia. 5)
- 94-63-163B (for fir tree stud dia. 6)

115 V

- 94-66-103B (for dia. 3mm)
- 94-66-104B (for dia. 4 mm)
- 94-66-105B (for dia. 5 mm)
- 94-66-106B (for dia. 6 mm)
- 94-66-171B (for dia. 7.1 mm)
- 94-66-108B (for dia. 8 mm)
- 94-66-153B (for fir tree stud dia. 5)
- 94-66-163B (for fir tree stud dia. 6)

Change over kit (for 230 V and 115 V)

- 94-43-203B (Ø 3)
- 94-43-204B (Ø 4)
- 94-43-205B (Ø 5)
- 94-43-206B (Ø 6)
- 94-43-271B (Ø 7,1)
- 94-43-208B (Ø 8)
- 94-43-253B (Ø 5 fir tree stud)
- 94-43-263B (Ø 6 fir tree stud)



PAH-1



- Universal design for flat surfaces
- Hand gun for fully automatic stud feed (with VBZ-3) or hand feed
- Recommended for large-scale production

M3 to M8
#4 to 5/16"



- Used for welding with templates
- Hand gun for fully automatic stud feed (with VBZ-3) or hand feed
- Recommended for large-scale production

M3 to M8
#4 to 5/16"



Suitable stud welding unit	CDi 1502, CDMi 2402, CDMi 3202, ARC 800, ARC 1550, IT 1002, IT 50, IT 90	CDi 1502, CDMi 2402, CDMi 3202, ARC 800, ARC 1550, IT 1002, IT 50, IT 90
Welding process	CD, SC	CD, SC
Stud material		
Welding range	M3 to M8, dia. 3 to 8 mm / #4 to 5/16", dia. #4 to 5/16"	M3 to M8, dia. 3 to 8 mm / #4 to 5/16", dia. #4 to 5/16"
Stud length	8 to 30 mm / 0.31" to 1.18"	8 to 30 mm / 0.31" to 1.18"
Stud type	Welding elements with flange according to current standards (other studs on request)	Welding elements with flange according to current standards (other studs on request)
Stroke	Adjustment range 5 mm / 0.20"	Adjustment range 5 mm / 0.20"
Welding cable	3 m / 9.84'	3 m / 9.84'
IP	IP 20	IP 20
Workplace noise level	>90 dB (A) may occur during welding	>90 dB (A) may occur during welding
Dimension LxWxH	295 x 60 x 170 mm / 11.61" x 2.36" x 6.70" (without cable)	295 x 60 x 170 mm / 11.61" x 2.36" x 6.70" (without cable)
Weight	1.4 kg / 3.09 lbs (without cable)	1.4 kg / 3.09 lbs (without cable)

Order No.

- 94-20-025 (Tripod)
(equipped for one stud dimension according to customer request)

- Sets
- CDi1504PAH (CDi 1502, PAH-1, ground cable)
 - CDMi242AT (CDMi 2402, PAH-1, ground cable)
 - ARC8001AT (ARC 800, PAH-1, ground cable)

- Assortment box
(Pin stop, guide bushing, mounting tool, feed tube, socket wrench, plunger, pin)

- 84-40-013A (dia. 3 to 8 mm, length 6 to 30 mm - for manual stud feeding by hand)
- 84-43-013A (dia. 3 to 8 mm, length 6 to 30 mm - for automatic stud feeding by VBZ-3)



Quick-Boy

- 92-40-140 for PAH-1



Order No.

- 94-20-028 (PZV dia. 30 mm)
(equipped for one stud dimension according to customer request)

- Assortment box
(Pin stop, guide bushing, mounting tool, feed tube, socket wrench, plunger, pin)

- 84-40-013A (dia. 3 to 8 mm, length 6 to 30 mm - for manual stud feeding by hand)
- 84-43-013A (dia. 3 to 8 mm, length 6 to 30 mm - for automatic stud feeding by VBZ-3)

Quick-Boy

- 92-40-140 for PAH-1

Legend Welding process: CD = Capacitor discharge stud welding, SC = Short cycle stud welding

Mild steel Stainless steel Aluminium Brass

KAH 412



KAH 412 LA



- Setting the lift and plunge via digital display (selection mm/inch)
- No length compensation

M3 to M8 (10 to 12.7 mm)
#4 to 5/16" (3/8" to 1/2")



- Setting the lift via adjustment screw (increments 0.1 mm)
- Length compensation of length variances in studs height and variances of the workpiece

M3 to M8 (10 to 12.7 mm)
#4 to 5/16" (3/8" to 1/2")



Welding process	CD - Contact welding (optional) CD - Gap welding SC, ARC (optional)	CD - Gap welding SC, ARC (optional)
Stud material		
Welding range	M3 to M8, dia. 3 to 8 mm; #4 to 5/16", dia. #4 to 5/16" (dia. 10 to 12.7 mm; dia. 3/8" to 1/2" with modification only)	M3 to M8, dia. 3 to 8 mm; #4 to 5/16", dia. #4 to 5/16" (dia. 10 to 12.7 mm; dia. 3/8" to 1/2" with modification only)
Stud length	8 to 40 mm; 0.31" to 1.57" (other lengths on request)	8 to 40 mm; 0.31" to 1.57" (other lengths on request)
Stud type	Welding elements with flange according to current standards (other studs on request)	Welding elements with flange according to current standards (other studs on request)
Stroke/Length compensation	--	0.2"/0.08", 0.16"/0.12"
Spring pressure	Arresting	Arresting
IP Code	IP 20	IP 20
Workplace noise level	> 90 dB (A) may occur during welding	> 90 dB (A) may occur during welding
Dimension LxWxH	375 x 66 x 145 mm, 14.76" x 2.60" x 5.71" with chuck and quick change system	375 x 66 x 145 mm, 14.76" x 2.60" x 5.71" with chuck and quick change system
Weight	3.4 kg; 7.50 lbs	3.4 kg; 7.50 lbs

Order No.
94-31-412C
(equipped for one stud dimension according to customer request)

Order No.
94-37-412 (with length compensation)
(equipped for one stud dimension according to customer request)



Assortment box
(Pin stop, guide bushing, mounting tool, feed tube, socket wrench, plunger, pin)

84-41-312A (Ø 3 - 8 mm, length 6 - 40 mm - for manual stud feeding by hand)
84-42-312A (Ø 3 - 8 mm, length 6 - 40 mm - for automatic stud feeding by VBZ-3)

Assortment box
(Pin stop, guide bushing, mounting tool, feed tube, socket wrench, plunger, pin)

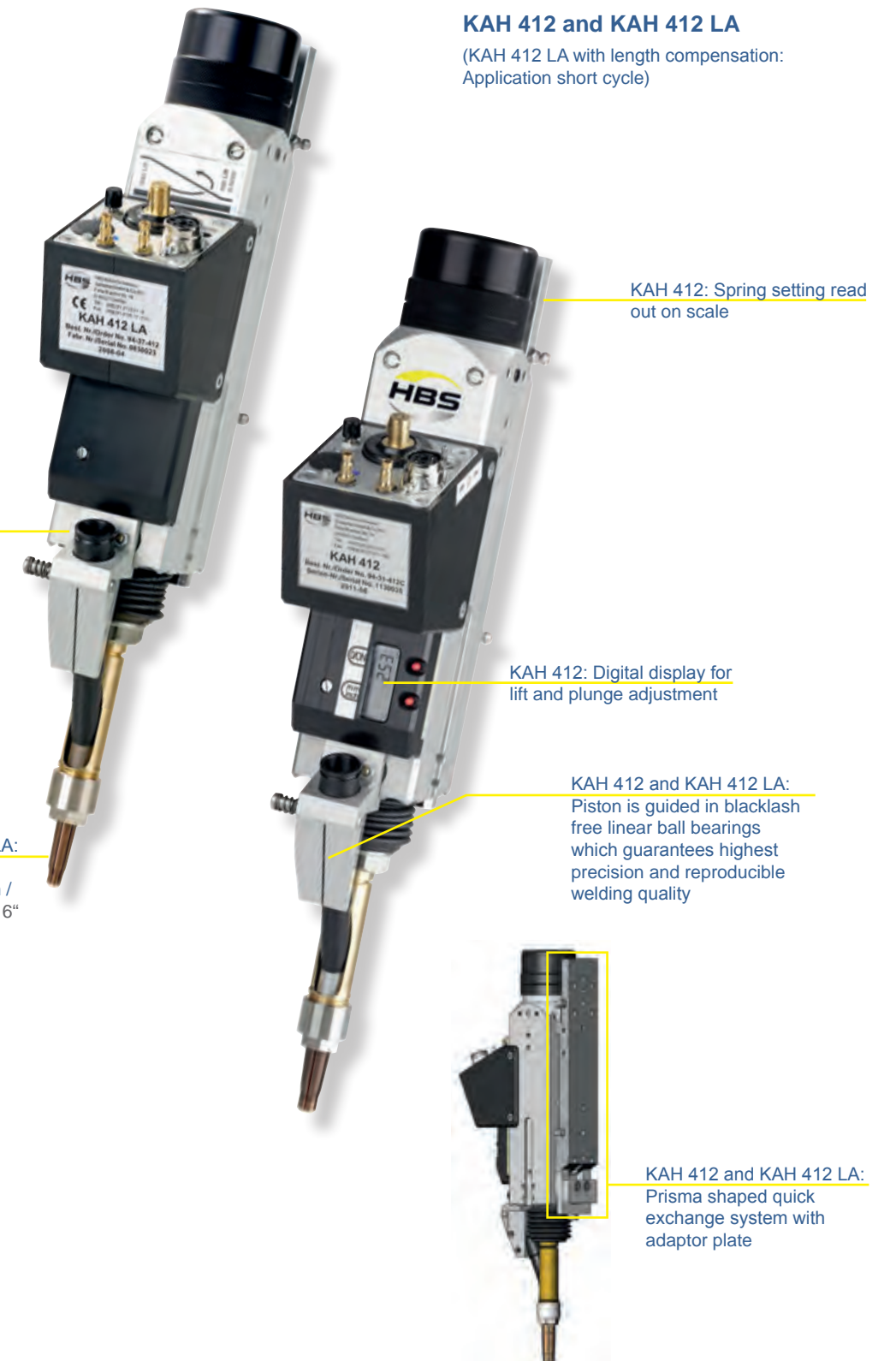
84-41-312A (Ø 3 - 8 mm, length 6 - 40 mm - for manual stud feeding by hand)
84-42-312A (Ø 3 - 8 mm, length 6 - 40 mm - for automatic stud feeding by VBZ-3)

Legend Welding process: CD = Capacitor discharge stud welding, SC = Short cycle stud welding

Mild steel Stainless steel Aluminium Brass

HBS precision welding head

KAH 412 and KAH 412 LA
(KAH 412 LA with length compensation: Application short cycle)





PC-S



- High-quality solid work table with stationary welding head
- For stud welding with manual (by hand) or fully automatic stud feeding (by VBZ-3)
- Anti wear protection on work plate
- Rugged working stroke of stud welding head

M3 to M8 (dia. 10/12/12.7 mm only possible with modification)
#4 to 5/16" (dia. 3/8" to 1/2" only possible with modification)



T-slot work plate	500 x 375 mm / 19.69" x 14.76"
Welding range	M3 to M8, dia. 3 to 8 mm (dia. 10/12/12.7 mm only possible with modification) #4 to 5/16", dia. #4 to 5/16" (dia. 3/8" to 1/2" only possible with modification)
Stud length	8 to 40 mm / 0.31" to 1.57" (other dimensions on request)
Stud feeding	Manual or automatic stud feeding (not included in delivery)
Positioning accuracy of welded stud	± 0.2 mm / ± 0.008"
Working stroke of welding head	Z-max. = 125 mm, z-adjustable = 4 to 45 mm (bottom end stop) Z-max. = 4.92", z-adjustable = 0.16" to 1.77" (bottom end stop)
Welding head	KAH 412, alternative KAH 412 LA (not included in delivery)
Max. number of stud welding heads	1
Connections	Electrical: 230 V/115 V, 16 A, 50 Hz, Pneumatic: 6 bar min/10 bar max./inner hose dia. 6 mm / 1/4"
Dimension LxWxH	1200 x 1000 x 2000 mm (without machine protection cover), 1400 x 1000 x 2200 mm (with machine protection cover) 47.24" x 39.37" x 78.74" (without machine protection cover), 55.12" x 39.37" x 86.61" (with machine protection cover)
Weight	Approx. 150 kg / 330.69 lbs (without machine protection cover)

Order No.

90-70-5028D

88-16-446 (Machine protection cover)



CPW Series



- Entry-level CNC stud welding machine with 1 welding head
- High speed with highest positioning accuracy by robust machine base frame
- Working with different work piece heights on a working range of 600 x 420 x 120 mm

M3 to M8 (dia. 10/12/12.7 mm only possible with modification)
#4 to 5/16" (dia. 3/8" to 1/2" only possible with modification)



Working range	600 x 420 x 120 mm / 23.6" x 16.5" x 4.7" (maximum working range for 1 welding head)
T-slot work plate	800 x 490 mm / 31.5" x 19.3"
Welding range	M3 to M8, dia. 3 to 8 mm (dia. 10/12/12.7 mm only possible with modification) #4 to 5/16", dia. #4 to 5/16" (dia. 3/8" to 1/2" only possible with modification)
Stud length	8 to 40 mm / 0.31" to 1.57" (other lengths on request)
Welding capacity	Up to 30 studs/min (depending on configuration)
Traverse speed	25 m/min (X-Y), 20 m/min (Z) / 82"/min X-Y, 65.6"/min Z
Stud feeding	Automatic stud feeding (up to 3 different stud length per welding head)
Positioning accuracy of welded stud	± 0.2 mm / ± 0.008"
Positioning and repeat accuracy	± 0.05 mm / ± 0.002"
Stud welding head	KAH 412 Optional: KAH 412 LA (mechanical length compensation - gap)
Max. number of stud welding heads	1
Connections	Electrical: 400 V*, 16 A, 50 Hz; Pneumatic: 6 bar min./10 bar max./inner hose dia. 6 mm *alternative primary power see „Order No.“
Motor-driven Z-axis	Z = 0 to 120 mm / 0 to 4.7" (free programmable because of servo drive technology)
Controller	High performance PLC IEC 61131-3
Display	9" Touchscreen
Keyboard	Touch
Dimension LxWxH	1600 x 950 x 1900 mm / 63" x 37.4" x 74.8"
Weight	Approx. 640 kg / 1.411 lbs

Order No.

88-19-644 (400 V)
88-21-381 (480 V)

(associated components, stud welding head, stud welding unit, automatic stud feeding and accessories)



MPW Series



- High performance CNC stud welding machine (with up to 4 welding heads)
- Highest speed possible with high positioning accuracy through rugged design
- Very short set-up time (a.e. automatic calibration of Z-axes)
- Network connection

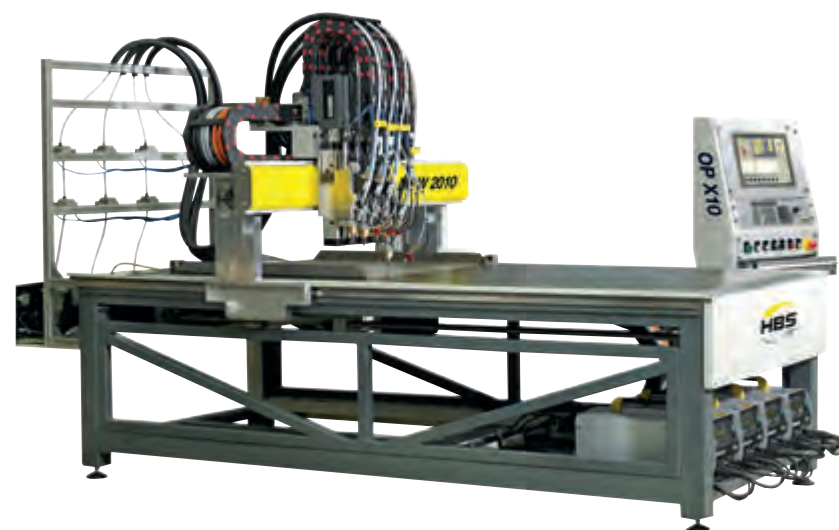
M3 to M8 (dia. 10/12/12.7 mm only possible with modification)
 #4 to 5/16" (dia. 3/8" to 1/2" only possible with modification)



Working range	1250 x 1050 mm / 49,21" x 41,34" (MPW 1010); 1250 x 2250 mm / 49,21" x 88,58" (MPW 2010); 3000 x 1500 mm / 118,11" x 59,06" (MPW 3015) (maximum working range for up to 3 welding heads)
Welding range	M3 to M8, dia. 3 to 8 mm (dia. 10/12/12.7 mm only possible with modification) #4 to 5/16", dia. #4 to 5/16" (dia. 3/8" to 1/2" only possible with modification)
Stud length	8 to 40 mm / 0.31" to 1.57" (other lengths on request)
Welding capacity	Up to 40 studs/min ((depending on configuration)
Traverse speed	Up to 60 m/min / 196.85"/min (max. 48 m/min / 157.48"/min per axis)
Stud feeding	Automatic stud feeding (up to 3 different stud length per welding head)
Positioning accuracy of welded stud	± 0.15 mm / ± 0.0059" for steel and ± 0.2 mm / ± 0.008" for aluminium (depending on work piece and stud geometry)
Positioning and repeat accuracy	± 0.05 mm / ± 0.002"
Stud welding head	KAH 412 Optional: KAH 412 LA (mechanical length compensation - gap)
Max. number of stud welding heads	4 (up to 3 stud lengths per welding head possible)
Connections	Electrical: 400 V, 32 A, 50 Hz Pneumatic: 6 bar min./10 bar max./inner hose dia. 6 mm / 1/4"
Motor-driven Z-axis	Z = 0 to 200 mm / 0 to 7.87" (free programmable because of servo drive technology)
Dimension LxWxH	2300 x 2350 x 2200 mm / 90,55" x 92,52" x 86,61" (MPW 1010); 3500 x 2350 x 2200 mm / 137,80" x 92,52" x 86,61" (MPW 2010); 3500 x 4550 x 2200 mm / 120,08" x 179,13" x 86,61" (MPW 3015)

Order No.

According to project



MPW Accessories

Code Reader



Calling up welding programs made easy

Customer benefits

Time-savings
The code reader reduces your search and startup times for welding programs.

Error prevention
The code reader ensures the clear-cut assignment of your welding programs to the workpieces.

Order No. 88-21-127

Adjustment set for welding head



Ensuring the accuracy of the stud welding machine

Customer benefits

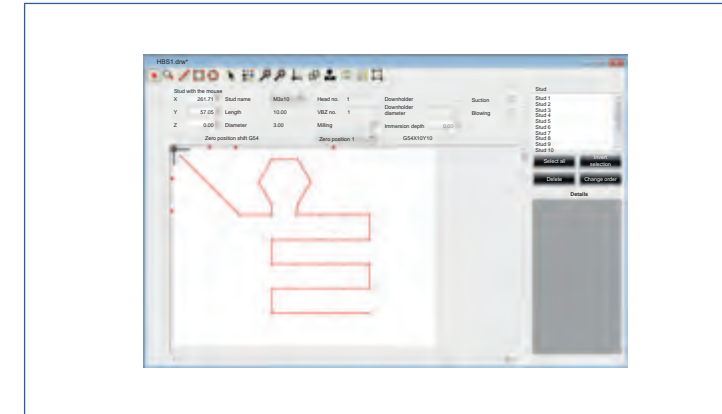
Independent testing and, if necessary, realignment of the position of the welding heads of the MPW series after changing welding heads.

Ensure the accuracy of the stud welding machine through periodic inspection of the welding head position.

Detection of hidden flaws or damage with regard to the welding head position.

Order No. 88-22-301B

CAD Software



HBS CAD converts a DXF-file into a CNC program

Customer benefits


Enables external programming by using a DXF file.


Time saving.


Error prevention.


Order No. 80-50-0660





	Pneum. single feed unit PBZ	for: KAH 412 for: installation in systems of the MPW series
M3	94-43-133	
M4	94-43-134	
M5	94-43-135	
M6	94-43-136	
M8	94-43-138	


	Pneum. single feed unit PBZ	for: KAH 412 for: installation in systems of the CPW series (Basic kit 88-20-206 necessary)
M3	88-18-163	
M4	88-18-164	
M5	88-18-165	
M6	88-18-166	
M8	88-18-168	


	Pneum. single feed unit PBZ	for: KAH 412 for: installation in automatic systems and systems of type PC-S
M3	94-43-033	
M4	94-43-034	
M5	94-43-035	
M6	94-43-036	
M8	94-43-038	


	Pneumatic stud feeding switch PBW complete	for: Feeding studs with the same diameter but different lengths into one automatic welding head for: installation in automatic systems
M3	80-08-0471B	
M4	80-08-0472B	
M5	80-08-0473B	
M6	80-08-0474B	
M8	80-08-0475B	


	PMB-S (vertical movement)	Pneumatic ground clamp including clamp, swivelling, single acting for: installation in systems of the MPW series, in automatic systems and systems of type PC-S
		90-60-011


	PMB-S (vertical movement)	Pneumatic ground clamp including clamp, swivelling, single acting incl. sliding block for: installation in systems of the CPW series
		90-61-011


	PMB-LS2 (horizontal and vertical movement)	Pneumatic ground clamp including clamp (double clamp = extra charge), linear swivelling, double acting for: installation in systems of the MPW series, in automatic systems and systems of type PC-S
		90-60-120


	PMB-LS2 (horizontal and vertical movement)	Pneumatic ground clamp including clamp (double clamp = extra charge), linear swivelling, double acting incl. sliding block for: installation in systems of the CPW series
		90-61-120


	SSS Welding current sensor	for: Signal output - welding current was active incl. connection cable (5 m)
		90-70-020


	Solenoid valve	for: switching the compressed air for manual stud feeding or for closing/opening the ground clamp
		80-10-188


	Utensil socket	for: Solenoid valve 80-10-188
		80-10-189


	Ring initiator	to: See if stud has been fed
hole-Ø		
10 mm	80-50-0083	
20 mm	80-50-491	


	Coupling ring initiator	for: Connection between ring initiator and CNC control
		80-10-375


	ESS External weld start	for: HBS power units with 7-pin-plug
		90-70-016


	Connecting line complete for welding head KAH 412 continuously	for: CDMi 2402, CDMi 3202, ARC 800 AT, ARC 1550 AT, IT 1002 AT
3 m, 25 mm ²	92-40-131	
5 m, 35 mm ²	92-40-130	

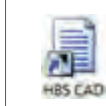
	Working stroke complete, with height adjustment (125/45 mm) with-out ring initiator	for: KAH 412
		80-09-760


	Working stroke complete, with height adjustment (125/45 mm) with ring initiator	for: KAH 412
		80-09-750

	Device for pneumatic fixture workpiece	for: KAH 412 to hold down the workpiece
Stroke 100 mm	80-08-702	

	Adjustment set for welding head position	for: KAH 412 for setting the welding head after a welding head change or as a quality measure to ensure the accuracy of the stud welding machines type MPW and TKM 2
		88-22-301B

	Code Reader	incl. software package for: calling up welding programs via barcode in the control system of stud welding machines type MPW and TKM 2
		88-21-127

	CAD Software	for: MPW 1010/2010/3015 for: creating welding programs for MPW control
		80-50-0660

	RDS Software	for: MPW 1010/2010/3015 for: Error analysis in the MPW control
		80-50-2011

Welding technique	Type of stud ¹⁾	Symbol for stud	Symbol for ceramic ferrule
Stud welding with tip ignition - CD	Threaded stud (pitch) ²⁾	PT	—
	Unthreaded stud (pin) ²⁾	UT	—
	Stud with internal thread ²⁾	IT	—
	Ground clip single style	F1	—
	Ground clip double style	F2	—
Drawn arc stud welding with ceramic ferrule or shielding gas - ARC	Threaded stud with reduced shaft ²⁾	RD	RF
	Virtually fully threaded stud	DD (MD)	UF (MF)
	Partially threaded stud (pitch) ²⁾	PD	PF
	Unthreaded stud (pin) ²⁾	UD	UF
	Stud with internal thread ²⁾	ID	UF
	Shear connector ²⁾	SD	UF/DF
Short cycle drawn arc stud welding - SC	Threaded stud with flange (pitch) ²⁾	PS	—
	Unthreaded stud (pin) with flange ²⁾	US	—
	Stud with internal thread and flange ²⁾	IS	—

¹⁾ Further types of stud and ceramic ferrules can be specified as required for special applications.

²⁾ according to standard DIN EN ISO 13918

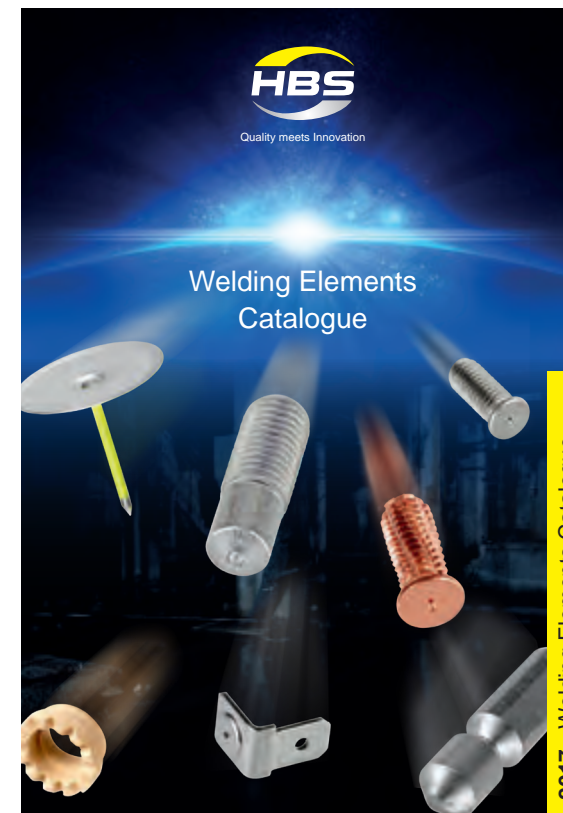
HBS – The Best Solutions

Our products are made and based on over 40 years of development experience and know how in stud welding technology. HBS welding elements encompass this technology. Use of HBS welding elements guarantees a continuous high quality weld.

The five major welding processes of capacitor discharge, drawn arc, short cycle, insulation and MARC have been designed to cover a wide range of applications. They are most commonly utilised for: vehicle construction, automotive supply industry, steel construction, mechanical engineering, electrical engineering, apparatus / casing

construction, control panel, cabinet construction, commercial kitchens, laboratory and health techniques, food industry, household appliances, information technology, metal fittings, curtain walling, steel construction, ventilation construction, insulating techniques, fire-proof insulation of power and combustion plants, vessel construction, shipbuilding etc.

With HBS stud and equipment products and technology, major benefits are realised from finding every thing from one source. As a complete system provider you have one supplier, cost effective, fast delivery along with sustained high quality. This also applies to a variation in studs e.g. threaded studs, pins, studs with internal threads, ground clips, pads. Additionally we supply customised welding elements.



Welding Elements Catalogue



Leading through Technology, Quality and Service

Stud Welding Systems Catalogue

2017