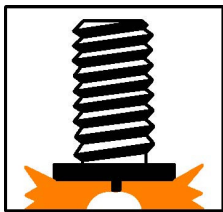


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Operating manual for stud welding gun CDK1 (HP-TSK 310)

CDK1 (HP-TSK310) Order.no.; 86190612 (12 Pol)
86190604 (4 Pol)
86190607 (7 Pol)



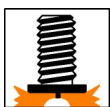
DABOTEK ApS Stud Welding

Welding equipment and machines

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Copyright

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General

Who this manual is intended for

This manual is intended for
the user of the stud welding gun
the personnel of the retail customer, who operate and connect the appliance
What this manual contains

This manual provides information about

operation,
care and maintenance,
transport, positioning and connection,
technical data,
spare parts.

What this manual does not contain

This manual does not contain repair instructions.

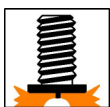
Further information

In addition to this manual, you can obtain further technical information, if required, via our agents or directly from our head office.

This manual provides important information, which is essential for working safely with the stud welding set. The operating personnel must have access to this manual. Please, therefore, hand this manual to the personnel in good time.

If you sell the welding set, please pass this manual on to the new owner. Also, please let us have immediately the name and address of the new owner, in case we have to send him unexpectedly an information update concerning the safety of the appliance.

Remark: Please read this manual carefully from beginning to end before installing the equipment. Pay particular attention to the notes concerning safety.



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Customer service

DABOTEK ApS
Birkedam 10 S
DK 6000 Kolding
Denmark

Telefon: +457930 7500

Telefax: +457930 7505

Stud Welding Department If a fault occurs, please give us the following information:

Machine or article number

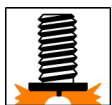
which welding appliance Serial No.

which welding head

a description of the faults which occurred

Please confirm all service requests in writing.

Please contact us for welding problems or sample welds. We can help you with our welding laboratory.



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Safety

The stud welding gun has been built to the latest standards and is safe in operation. Danger may, however, arise from these appliances if they are inexpertly connected and commissioned by untrained personnel or when they are used for purposes for which they are not intended.

Every person concerned with the connection, operation and repair of the equipment must have read and understood the corresponding instructions and in particular the section Safety.

The various components of the appliance must only be connected, started up and repaired by persons who are familiar with this and are informed about the dangers involved

The applicable regulations as well as any other generally recognized rules must be observed.

Should you nevertheless be unclear about something, please ask your supervisor or the manufacturer.

Abstain from any type of operation which interferes with the safety of the appliance components or the machine.

On principle, no safety arrangements must be removed or disabled. The safety arrangements protect against serious injuries (electric shock, etc. etc.).

Appliance components which are added by the user to form operational machines or plants must be equipped by the user with up to date safety arrangements.

If recognizable faults or shortcomings occur which reduce safety, as well as unusual noises and smells, switch the appliances or machine off and inform your supervisor

Have the appliances and in particular the connection leads with plug checked for sound condition by a qualified person at least every 6 months.

Do not allow the connection leads to hang over sharp edges.

Do not lay the connection leads across traffic lanes or near heat sources.

The local safety and accident prevention regulations apply in all cases to the connection, operation and repair of the appliance components or the machines.

Warning against conversions and changes by the user

The manufacturer must be informed before conversions and changes are carried out.

Conversions and

changes carried out by the user invalidate the guarantee.



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Special notes for the use of the stud welder and its components

Remark: *All maintenance and repair work must only be carried out by trained technical personnel. Protective arrangements must not be removed.*



Always switch the appliance off before changing wear parts (electrical, compressed air, mechanical).



ALWAYS *pull the mains plug out of the mains socket !*
MORTAL DANGER !!!!



DO NOT USE ANY *liquids when cleaning the appliance! Liquids can enter the electrical system.*

Remark: *Do not look into the arc while welding is in progress !*

Remark: *Protect your skin, eyes and clothing against weld splashes.*

Remark: *Make sure that there are no combustible objects in the vicinity of the welding area or the weld spark area.*

Remark: *Protect your ears against noise!*

Do not move magnetizable objects into the vicinity of the welding set.

The welding process releases electromagnetic fields and, for example, watches, magnetic cards of all kinds can be rendered useless through this.



Persons who carry a heart pacemaker must be made aware of these electromagnetic fields. The possibility of the heart pacemaker being affected cannot be excluded.



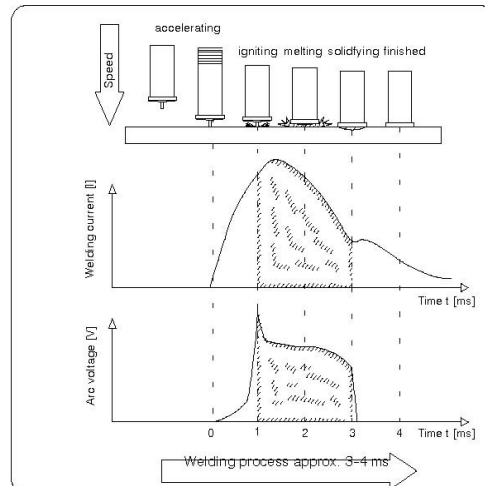
Do not touch or put a hand into moving or live parts.



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Description Welding method

The welding method is capacitor discharge welding with tip ignition. No shielding gas is used, not even for the welding of aluminium.



The welding stud is accelerated by the welding head to move at a speed of 0.5 – 1 m/sec in the direction of the base material. At the same time, the capacitor battery is switched on.

The ignition tip touches the base material and discharge current begins to flow. The ignition tip is heated up by high discharge current and evaporates all of a sudden.

The arc is ignited. It burns for some 1 or 2 milliseconds and melts on the base material.

The welding stud dips into the weld pool.

Heat absorption by the base material causes the weld pool to solidify.

The welding process is finished, leaving the stud firmly attached to the base material.

Application range of the welding gun CDK1 (HP-TSK310)

Connection to appliance types:

The welding gun CDK1 (HP-TSK310) is for connection to the following Capacitor Discharge welding appliances:

BS304/306/308/310/TS304/306/308/310 (1996 follow on models)

BS 304A / 306A / 308A / 310A / 318A with Programm PLC 0

DABOTEK ApS CD306/308/318/BS2/CD8000 (series discontinued 1995)

For these appliances you require an adapter with 12 pin appliance plug or a 7 pin plug on the gun.



Standard stud dimensions

The studs shown in the table can be used with the HP TSK310 and the corresponding clamping element Type CD SES.

You will find our complete stud range in our stud catalogue.

Stud dia. mm	Stud length mm	Material (DIN)		
3	6-25	St.37-3	1.4303	(AlMg3)
4	6-30	St.37-3	1.4303	AlMg3
5	8-30	St.37-3	1.4303	AlMg3
6	8-30	St.37-3	1.4303	AlMg3
7.1	10-30	St.37-3	1.4303	AlMg3
8	10-30	St.37-3	((1.4303))	((AlMg3))
10	10-30	((St.37-3))	((1.4303))	

Remark: At larger diameters weldability may be restricted.



The table only shows approximate values.

Not all studs can be welded across the entire diameter range.

The application range shown in table 1 is only a recommendation. Deviations may easily occur in practice.

Basic rules

Please observe the following basic rules when stud welding:

The workpiece surface must be free from oil or grease and must be clean.

Coatings such as zinc, scale, paint, anodizing etc. have a negative effect on weld quality or do not allow welding.

The base metal must be suitable for welding.

Steels with a high carbon content or free cutting steels cannot be welded.

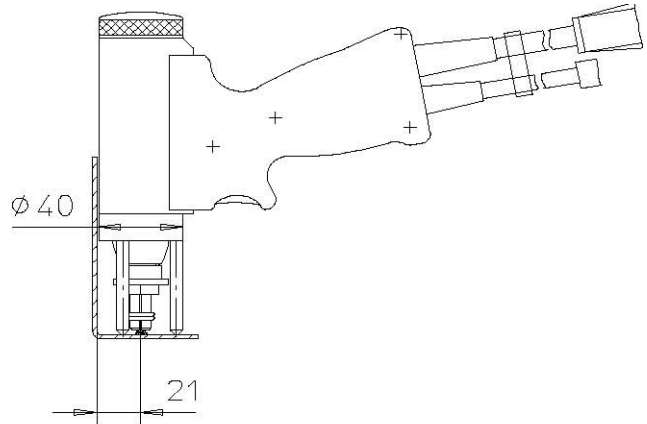
Use quality studs. The accuracy of the arcing tip has a direct effect on weld quality.

Always carry out test weldings before commencing production.



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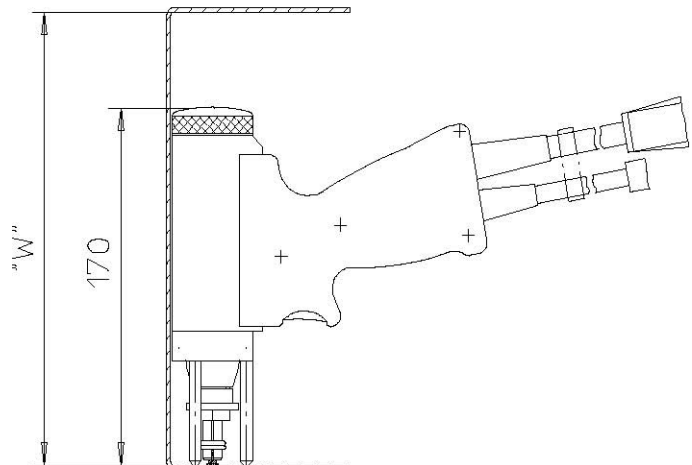
Minimum stud distance from walls



Minimum clearance in small housings

$$W = 170 + L$$

L = stud length



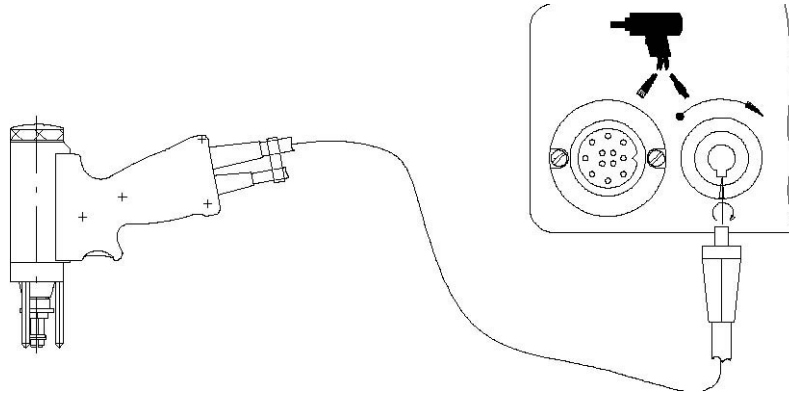
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Connection

Welding cable welding gun/welding set

Plug the welding cable plug of the welding gun into the welding bush.

Remark: Secure the plug connection by firmly turning the plug clockwise up to the stop.

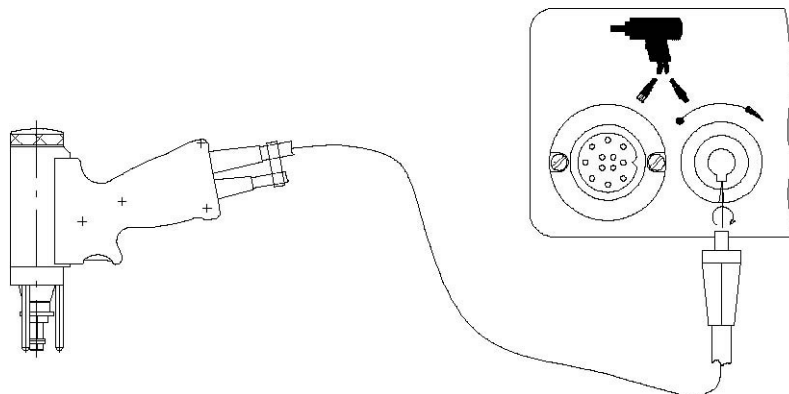


A loose welding current connection causes the plug connection to burn, resulting in lower weld quality !!!

Control cable welding gun / welding set

Plug the appliance plug of the control cable into the appliance socket of the welding set.

Remark: Secure the plug connection by turning the plug sleeve clockwise up to the stop.



A loose welding current connection causes the plug connection to burn, resulting in lower weld quality !!!

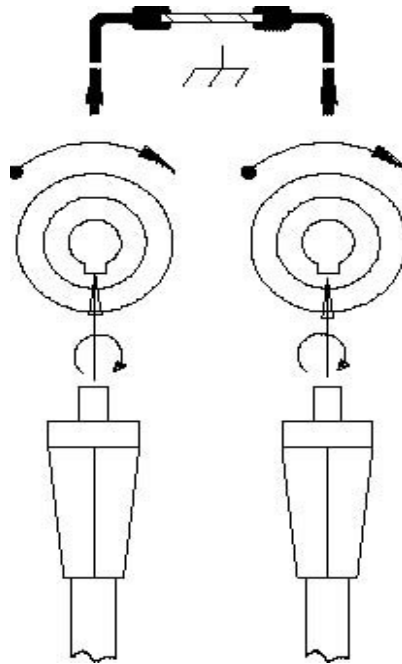


Connecting the earth cables

Earth bushes

Insert the plugs of the earth cables into the earthing bushes of the welding set.

Remark: the plug connection by firmly turning the plug clockwise up to the stop.



A loose welding current connection causes the plug connection to burn. Constant welding results are then no longer guaranteed.

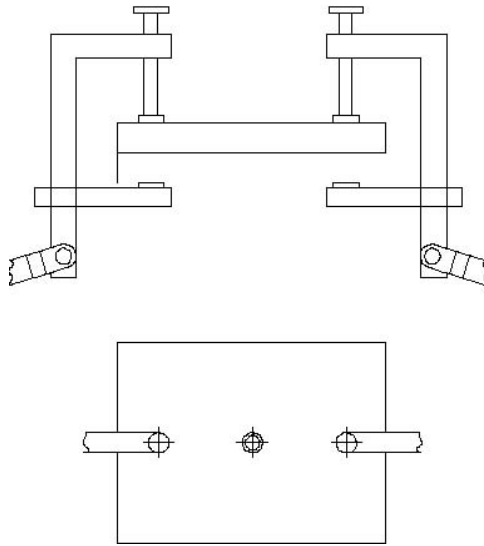


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Earthing terminals

Now connect the earthing cable with the workpiece.

Remark: *If possible fix the workpiece in a jig. Apply the earthing clamps as symmetrically as possible to the workpiece. Tighten the earthing clamps firmly.*



Loose earth connections may lead to secondary arcs at the transition point between earthing terminal and workpiece surface. This results in burned areas on the workpiece surface as well as irregular welding quality.

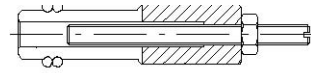


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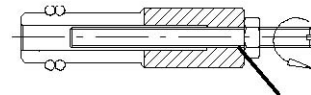
Stud holder

Adjusting the stud holder

Choose a clamping element Type CD SES for the corresponding stud diameter.

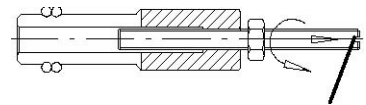


Slacken the locknut by turning it anticlockwise.



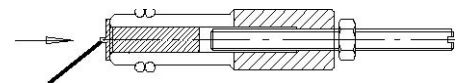
Locknut

Turn the adjusting screw anticlockwise out of the clamping element by approx. 20 mm



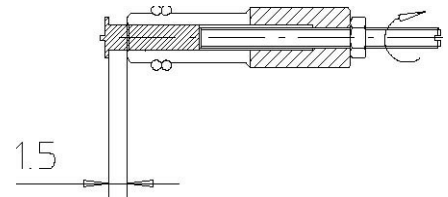
Adjusting screw

Push the stud into the clamping element up to the flange.

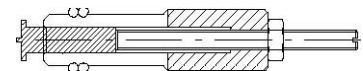


Stud

Turn the adjusting screw clockwise until a gap of 1.5 mm is created between the end face of the clamping element and the stud.



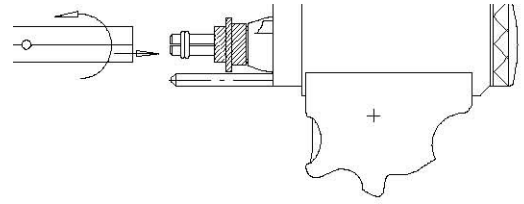
Tighten the locknut.



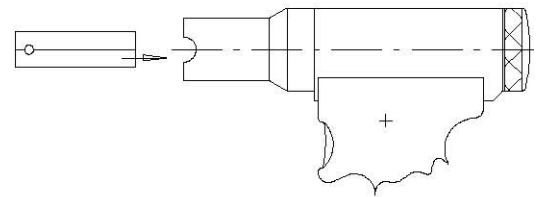
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Inserting the stud holder

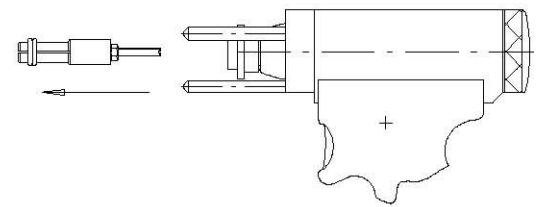
Push the socket wrench SW 17 supplied on the clamping nut. Release the clamping nut by turning it anticlockwise (2 ... 3 turns).



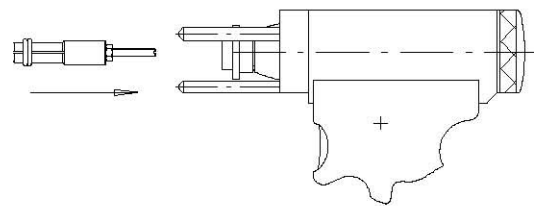
You do not have to remove the support tube or the support feet.



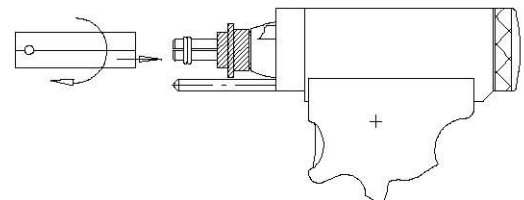
Pull the old stud holder out of the welding gun.



Push a new stud holder into the welding gun up to the stop.

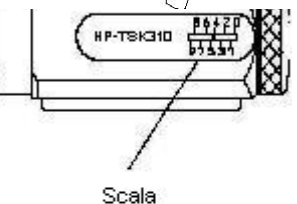


Push the socket wrench SW 17 supplied on the clamping nut. Tighten the clamping nut by turning it clockwise.



Setting the spring force

The prerequisites optimum weld quality are,



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apart from the material and the quality of the studs, the spring force welding parameters. With the HP-TSK 310 weld gun the stud is forced in to the weld pool by spring force during the welding process. You can change the spring force by turning the spring force adjusting knob. The spring force can be read off the 0...9 scale. You increase the spring force by turning the spring force adjusting knob clockwise.

By turning the spring force adjusting knob anticlockwise you reduce the spring force.

Stud material	Stud diameter (mm)	Contact pressure
Mild steel St. 37 3	3--8	4.5
Stenless steel	3--6	4.5

Remark: The table only shows approximate values. Not all studs can be welded across the entire diameter range. The application range shown in table 2 is only a recommendation. Deviations may easily occur in practice.

Adjusting the welding set



The maximum gap and spring force on the scale is "6" (on work).
The scale shows 6

Stud diameter	Stud material	Spring setting on scale
3, 4, 5, 6, 7.1, 8	St.37	1-3
3, 4, 5, 6, 7.1, 8	1.4303	1-3
3,	AlMg3	1-2
4		1.5-3
5,6		4.5-6

Remark: The table only shows approximate values. Not all studs can be welded across the entire diameter range. The application range shown in table 2 is only a recommendation. Deviations may easily occur in practice



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Welding

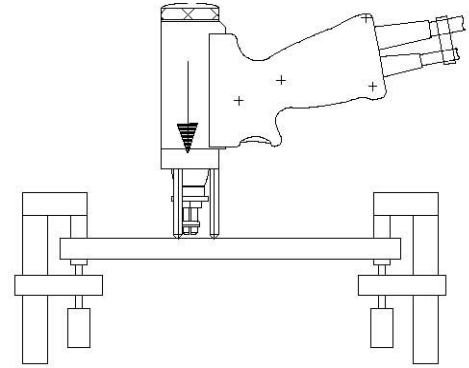
Have you read the operating manual of the welding set thoroughly? Have you connected all the components correctly?

After the welding set has been installed and all connections have been provided, you can start welding.

Switch on the welding set.

Push a stud into the stud holder of the welding gun.

Set the correct charging voltage and the correct spring force.

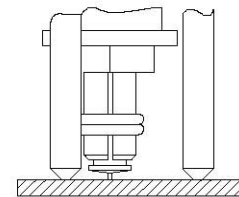


Apply the welding gun to the workpiece. Press the welding gun evenly against the workpiece until the three support feet touch the workpiece surface.

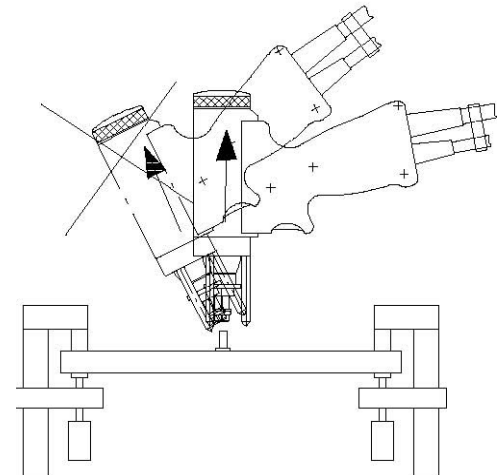
Now press the trigger button of the welding gun.

The weld process is triggered.

Hold the welding gun still during welding.



Withdraw the welding gun vertically upwards from the welded on stud



Remark: *Inclined withdrawal may damage the stud holder. This would lead to premature wear.*

The welding set is provided with the trigger lock. The welding current can only be triggered again after the welding gun has been withdrawn from the welded stud.



The welding can start only if one of three feet are in contact with the work piece. In this case the safety circuit release the trigger lock.

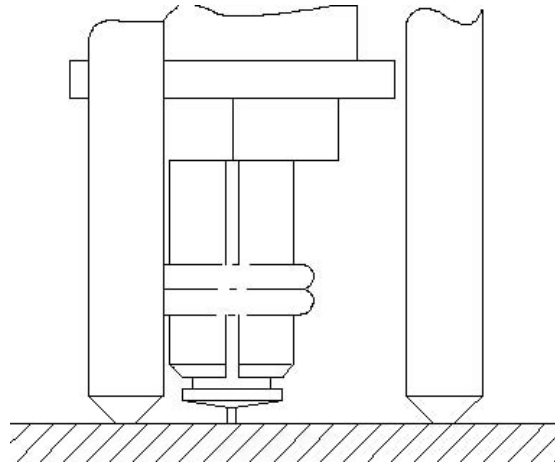


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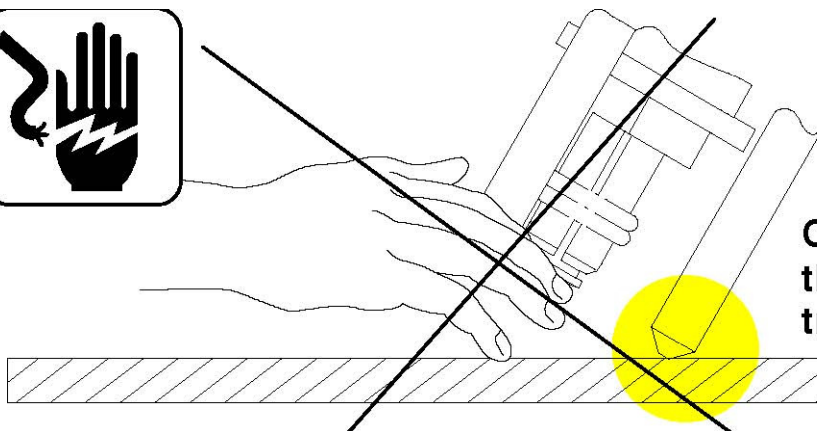
Safety advice



Only start welding, if all three feet or the tube are in contact with the work piece.



Do never touch the stud holder and the work piece or earth contact at the same time with your hand or some other parts of your body, if one foot is in contact with the work piece. The trigger lock is released and you can start welding.



Contact releases the trigger lock !



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Troubleshooting

Fault	Cause	Correction
Welding gun with stud pressed onto workpiece, trigger actuated no weld	Welding set not switched on	Switch on welding set
	Welding cable not connected	Connect welding cable
	Control cable not connected	Connect control cable
	no gap between stud and workpiece	Press stud into the gun until solenoid held it.
Welding gun with stud pressed onto workpiece, trigger actuated weld proceed but studs have no stability	Welding gun moved during welding	Keep welding gun still
	Welding energy too high or too low	Set the wright welding energie
	Welding cable broken Increased resistance	Check welding cable and replace if necessary
	Welding gun faulty	Check bearings and guide shaft and replace if necessary
Burn marks on stud	Stud holder worn	Replace stud holder
Studs are not always firm	Arc blow effect	Apply earthing contacts symmetrically to the welding position
Molten metal flows out of the welding zone on one side only	Earthing contacts applied too much on one side	
Adjustment correct, but studs have no stability	workpiece not weldable bad studs	change material change studs

Remark: Do you need help? If so, please contact our works direct:



Visual assessment of weld quality

A glance at the welded . on stud already gives you a first idea of the weld quality. Weld splashes evenly and not excessively distributed around the welded . on stud.



Correct immersion speed and welding energy !

No or only slight splashes around the welded . on stud.



Immersion speed too high or welding energy too low !

Correction:

Reduce immersion speed and check the bond. If the required weld strength is not achieved, increase welding energy.

Heavy splashes and weld metal beads around the welded on stud.



Immersion speed too low or welding energy too high !

Correction:

Increase immersion speed and check the bond. If the required weld strength is not achieved, reduce welding energy.



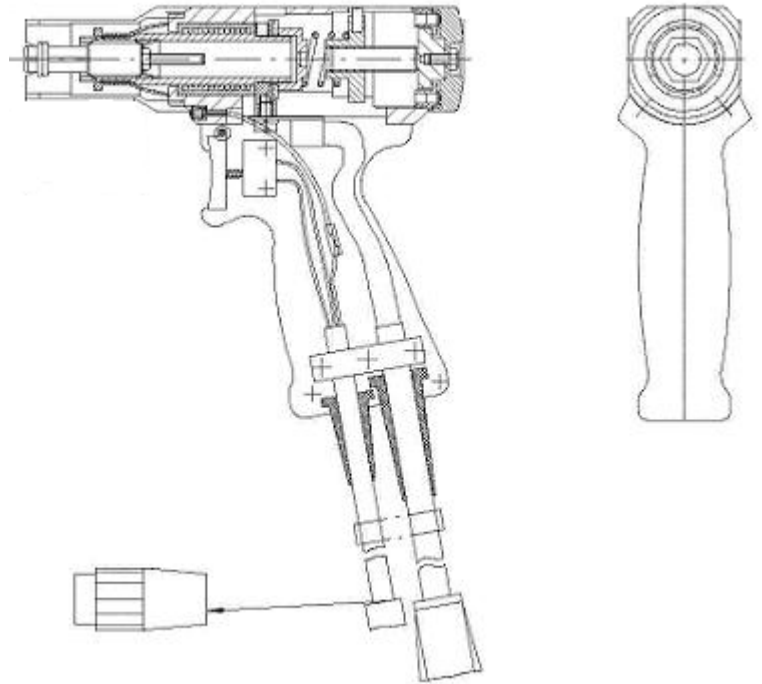
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Technical data

Welding gun HP-TSK 310 /foot / tube

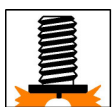
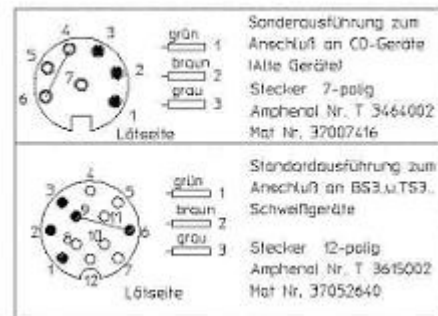
Technical Data

stud welding procedure	contact
stud Diameter	2,5-10mm
mass	1,5kg
Guide shaft	hardened steel grinded



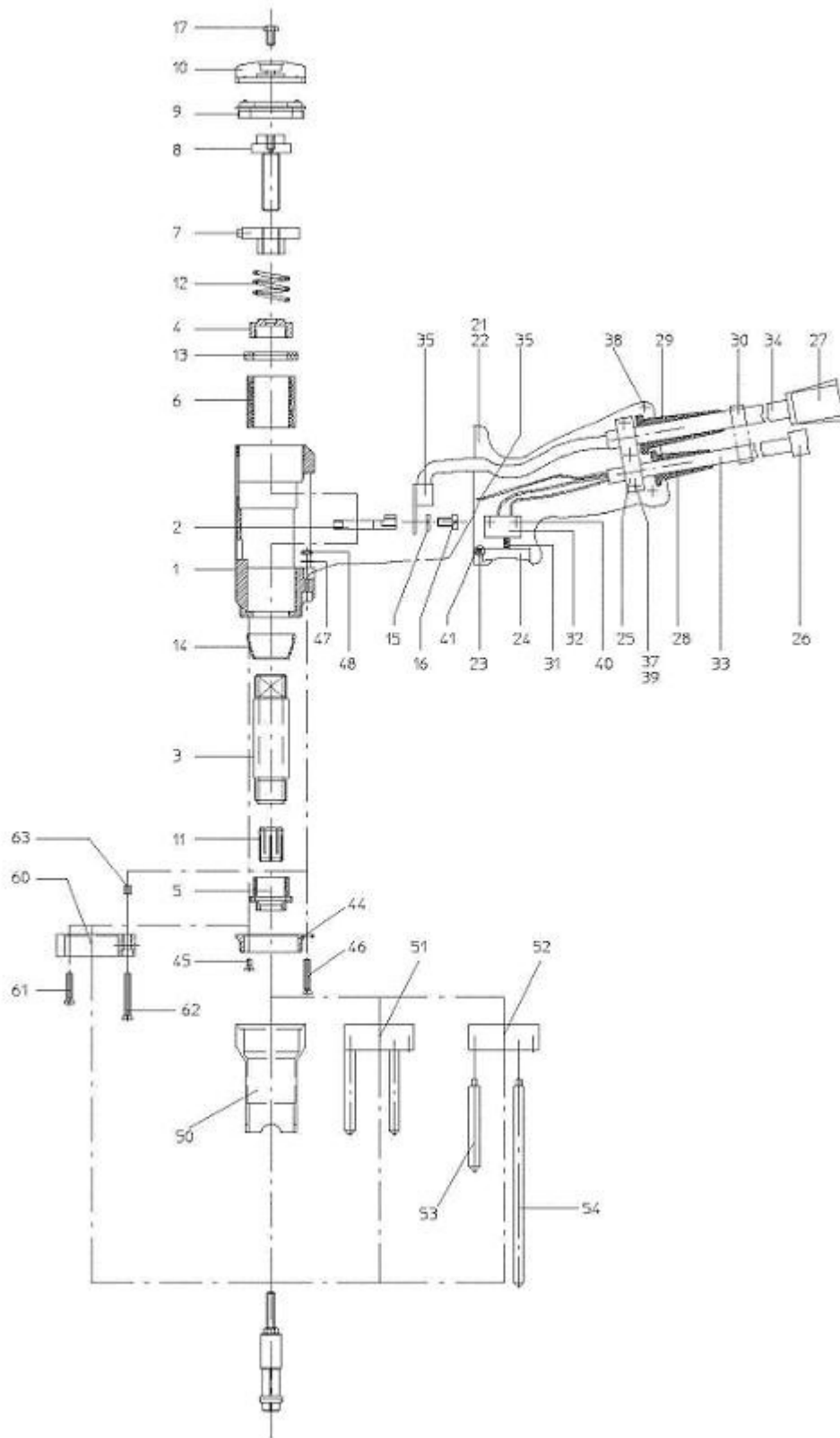
The gun is delivered with a 12-pin plug to connect it to the welding units Typ BS3x and TS 3x

The gun can also be connected to the previous welding units Type CD3x. in this cause a 7 pin plug must be used. The pin configuration is on the drawing inside.



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Parts of the HP-TSK 310

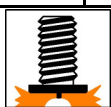


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Spare part list CDK1 (HP TSK 310)

Pos.	Name	Draw .no	Mat. .no.	Order .no.	DABOTEK Order.no
1	Body	4000706 1001	37050672	F4112008	600015
2	Contact piece	4000706 1002	07000022	F4002709	600047
3	Guide shaft with stop	4000706 1003 + 4001478 122 4	08811024 (37050737)	F4000676	600007 6000523
4	Lock nut	4000706 1004	07000049	F4002717	600017
5	Clamping nut	4000706 1005	37047434	F4112016	600012
6	Ball bushing		37048155	F4112024	600215
7	Setting piece	4000706 .1007 4000706 1011	37009559	F4112059	600006 600021
8	Adjusting screw	4000706 1008	37009540	F4112067	600009
9	Ring nut	4000706 1009	37028340	F4112083	600013 600019
10	Adjusting knob	4000706 1010	37023667	F4112091	190342
11	Clamping sleeve	4001478 113 4	37050745	F4112113	600523
12	Spring D .245 Fa.Gutekunst		37047655	F4112245	600137
13	Nordlock washer D18		37028308	F4112253	600008
14	Protection cape	HP 308 .01 14/4	37046004	F4112180	600014
15	Lock washer M5 DIN 128 .B5		F3405052	F	
16	Screw DIN 84 .M5x8		35011114	F	
17	Screw DIN 933 .M4x10			F	
18					
19					
	Handgrip				
21	Handgrip righth				602152
22	Handgrip left				602151
24	Trigger green				Z000730
25	Clamping part	HP 308 .02 .03/4	37013017	F4021703	Z0000077
26	Plug 12 pin		37052640	F4112202	Z0000074
27	Welding plug		37005669	F4112210	Z0000073
28	Cable protector		37006568	F4021495	Z0000075
29	Cable protector	HP 308 .02 .04/4	37006614		Z0000071
30	OBO ribbon clip		F2330202	F2330202	Z0000072
31					
32					
33	Control cable Länge 3,1m		37017373	F4112121	Z0000085
34	Welding cable Länge 3,m		37007300	F4021460	Z0000084

Pos.	Name	Draw .no	Mat. .no.	Order .no.	
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35	Cable connector 5mm 1qmm				Z0000078
36	Cable connector 5mm/25qmm				Z0000076
37	Lock washer DIN 128 .B4				
38	Screw DIN 912 .M3x10				
39	Screw DIN 84 .M4x6				
40	Screw DIN 7971 .B2,2x9,5				
41	Lock washer DIN 6799 2,3				
42					
43					
44	thread connector	4000706 .0009	37028332	F4112156	600039
45	Screw DIN 963 .M3x6				
46	Screw DIN 963 .M3x20				
47	Loch washer M3 DIN 128 A3				
48	Nut M3 DIN 934 .M3				
49					
50	Tube	4000706 .0004	37028618	F4019792	600011
51	Ring with foot	4019938 .0000		F4019938	
52	Ring	4000714 .0004	37028243	F4019369	600010
53	Foot		37028251	F4019946	150088
54	Foot long 116mm	4000714 .0007	37028278	F4019954	
55					
56					
	USA				
60	Head plate USA	4000692 .0009	37028316	F4020537	600038
61	Screw DIN 84 .M3x16		35000236	F	
62	Screw DIN 84 .M3*25		35000252	F	
63	Insert M3		37049488	F	
64					
	Equipment				
70	Key SW 17		37007297	F4112172	Z0000079



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Spare part list

We would recommend that repairs are only carried out by our after sales or repair department. This will give you the assurance that all work has been carried out correctly.

Should you nevertheless require spare parts, however, please order them from the following address:

DABOTEK ApS
Birkedam 10 S
DK 6000 Kolding
Denmark

Telefon: +457930 7500
Telefax: +457930 7505

You will find a list of the most important components on page 20-21.

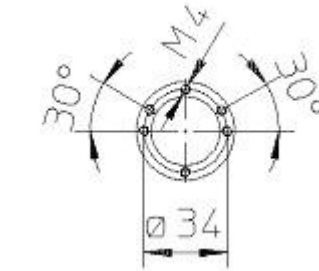
Remark: *For damages which are caused from the usage of spare parts which are not delivered by DABOTEK ApS, every liability and warranty is barred on parts DABOTEK ApS*



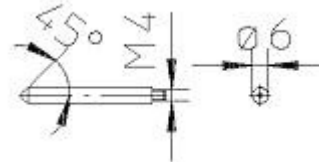
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Equipment

Ring for foots



foot 6-49



Ring with foot

Link to all legs:

http://www.dabotek.com/_en-GB/id:25?

[zpider.target=main&zpider.raw-action=main.aspx](http://www.dabotek.com/_en-GB/id:25?zpider.target=main&zpider.raw-action=main.aspx)

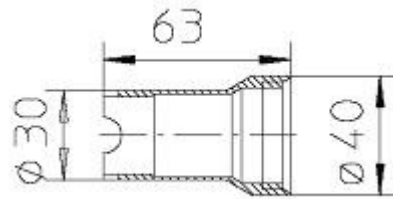


Tube

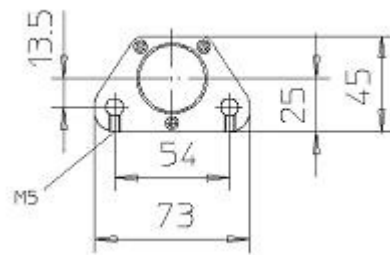
Link to all tubes

http://www.dabotek.com/_en-GB/id:25?

[zpider.target=main&zpider.raw-action=main.aspx](http://www.dabotek.com/_en-GB/id:25?zpider.target=main&zpider.raw-action=main.aspx)



Head plate USA



foot long C

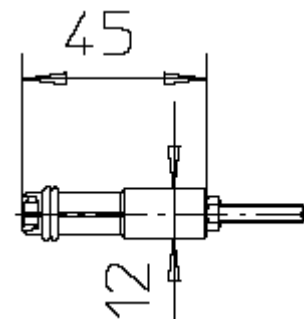


Stud holder

Stud holder type CD-SES



Operating manual CDK1 (HP-TSK 310)



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Stud Ø (mm)	Stud Ø (Inch)	Order No.	Mat. No.
2,5		4016009	37009001
2,6		4016157	37009168
3,0		4016017	37009028
3,4	0,135	4015878	37042211
4,0		4016025	37009036
4,1	0,161	4015886	37042246
4,3		4016173	37009184
4,4		4016165	37009176
4,7	0,187	4015894	37042262
5,0		4016033	37009044
6,0		4016041	37009052
6,3	1/4	4015800	37042300
7,1		4016076	37009079
7,9	5/16	4015819	37042327
8,0		4016068	37009060
9,5	3/8	4015827	37042343
10,0		4016084	37042343

STANDARD CHUCKS Ø10 outside:

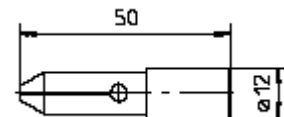
- 8250020 - 2 mm
- 8250025 - 2,5mm
- 8250003 - 3 mm
- 8250004 - 4 mm
- 8250005 - 5 mm
- 8250006 - 6 mm
- 8250071 - 7,1mm
- 8250008 - 8 mm
- 8250010 - 10 mm

"Old Standard" Chucks Ø12 outside

- 8350020 - 2 mm
- 8350025 - 2,5mm
- 8350003 - 3 mm
- 8350004 - 4 mm
- 8350005 - 5 mm
- 8350006 - 6 mm
- 8350071 - 7,1mm
- 8350008 - 8 mm
- 8350010 - 10 mm

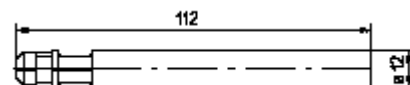
Stud holder type CD-ISO

Stud Ø (mm)	Stud Ø (Inch)	Order No.	Mat. No.
2,1		4016629	37008935
2,6		4016602	37008951
3,0		4016610	37008986



Stud holder type CD-SEL

Stud Ø (mm)	Stud Ø (Inch)	Order No.	Mat. No.
2,1		4016408	05900018

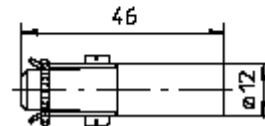
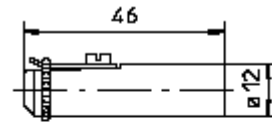


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2,5		4016416	05900026
2,6		4016424	05900034
3,0		4016434	05900042
4,0		4016440	05900050
4,4		4016459	05900069
4,7	0,187	4015894	37042262
5,0		4016467	05900077
6,0		4016475	05900085
7,1		4016491	05900115
8,0		4016483	05900093

Stud holder type CD-FS

Tab Connectors	Order No.
CD .FS 6,3	4016718
CD .SFS	4016793



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Transport

Transport and handling

The appliance is transported by suitable means in appropriate packaging. Please keep the transport packaging carefully. Transport or send the appliance only in this original packing. If you do not want to keep the packaging material, dispose of it as appropriate for the material.

Damage in transit

Contact our dispatch department before you return any goods.

Under no circumstances return the appliance to us without being asked to do so.

Be sure to adhere to the notification periods, since the replacement obligation of the carriers will otherwise lapse.

Packing damaged	
... during transit by	
Rail	Carriers
Unpack in the presence of a rail employee, have damage inspected and apply to the goods service department for a condition report.	Unpack in the presence of the driver. Obtain written confirmation of the damage.
Notification period: 1 week	Notification period: 4 days
Packaging in order; contents damaged	
Notify the goods clearance department concerned. Inspect and apply for a condition report.	Notify the carriers and ask for an inspection. Have damage inspected.
Notification period: 1 week	Notification period: 4 days

