DUAL-SPOTTER™

ALUMINUM & STEEL
STUD WELDING SYSTEM

OPERATOR MANUAL

C ETL LISTED US
Intertek

IMPORTANT: BEFORE STARTING THE EQUIPMENT, READ THE ENTIRE MANUAL.

THIS MANUAL MUST BE STORED IN A PLACE FAMILIAR TO ALL USERS FOR THE ENTIRE OPERATIVE LIFE-SPAN OF THE MACHINE. THIS EQUIPMENT MUST BE USED SOLELY FOR WELDING OPERATIONS BY SKILLED TECHNICIANS.

9802-03 R_2026

SAFETY PRECAUTIONS - ***WELDING CAN BE HARMFUL TO YOURSELF AND OTHERS.***

1) **ELECTRIC SHOCK -** ***May be fatal!***
   Connect the welding machine to power lines according to applicable and NEMA regulations.
   Do not touch live electrical parts or electrodes with bare skin, gloves or wet clothing.
   Isolate yourself from exposed power, earth and the work piece bare metal.
   Make certain machine and work piece are grounded to earth per applicable regulations.

2) **FUMES AND GASES -** ***May be hazardous to your health!*** Work in the presence of adequate ventilation and/or with fume extraction system preventing fume build-up work area.

3) **ARC RAYS -** ***May injure the eyes & burn skin! Eye & skin protection must be worn!***
   Protect your eyes with #5 DIN (min.) filtered lenses and protect your body with appropriate safety garments when spot welding. Protect others by installing adequate shields or curtains.

4) **RISK OF FIRE AND BURNS -** ***Sparks may cause fires and burn the skin!*** Be certain there are no flammable materials in the area and wear appropriate protective garments.

5) **NOISE -** This machine does not directly produce noise exceeding 80dB; however, Users must take all precautions required by local codes or laws in the event they are below this level.

6) **PACEMAKERS -** The magnetic fields created by high currents may affect the operation of pacemakers. Wearers of vital electronic equipment (pacemakers) should consult their physician before beginning any arc welding, cutting, gouging or spot welding operations.

7) **EXPLOSIONS -** Do not weld in the vicinity of containers under pressure, or in the presence of explosive dust, gases or fumes. . All cylinders and pressure regulators used in welding operations should be handled with care.

8) **ELECTROMAGNETIC COMPATIBILITY -** This machine is manufactured in compliance with the instructions contained in the harmonized standard **and must be used solely for professional purposes in an industrial environment. There may be potential difficulties in ensuring electromagnetic compatibility in non- industrial environments.**

IF THERE ARE ADDITIONAL QUESTIONS OR CONCERNS, REQUEST ASSISTANCE FROM YOUR DEALER OR CONTACT FACTORY TECHNICAL SUPPORT @ 704-935-5242

1. DESCRIPTION OF TECHNICAL SPECIFICATIONS

NU-TEC SYSTEMS, LLC	
Model: Dual-Spotter	Part NO.:
U_{in}: 115V~, 50/60Hz	I_{1max}: 8A
U_{20}: 38V DC max	I_{2max}: 8000A
Duty: 10 Stud/min @80%	
Serial No.	Manufacturing date

U_{in}	Rated Supply Voltage
U_{20}	No-load Voltage
I_{1max}	Input Current (max.)
I_{2max}	Output Current (max.)
Duty	Duty-Cycle

2. Summary

The machine utilizes microprocessor capacitor discharge for stud welding with capacity Ø2- Ø6mm. Stud materials may be mild steel, stainless steel, aluminum, titanium (Ti), brass and copper. Stud Welding time is about 3/1000s-6/1000s. Given this very short cycle time, the welding heat will not damage or burn-thru the base metal, even when the base metal is thin sheet.

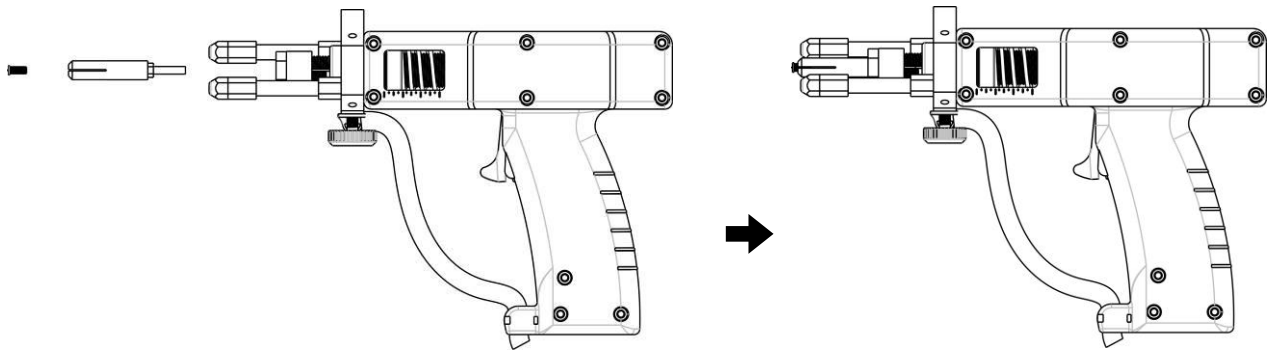
2-1 Warning

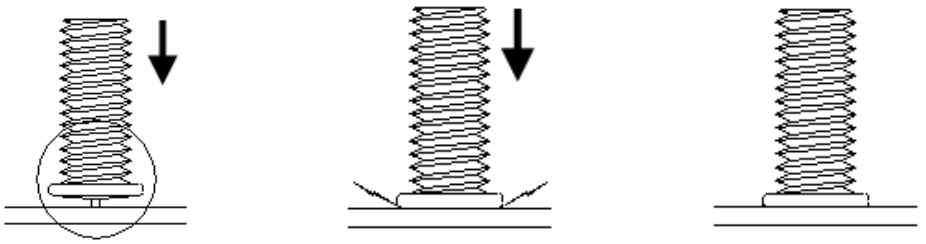
(1) Input power is 115VAC, 1-phase 50/60Hz. Please confirm the correct input voltage.
(2) The stud collet must be installed correctly in the stud welding torch head (see 2.7.2). The inside diameter of collet must match the stud diameter. Worn or incorrect stud collet can cause damage.
(3) Capacitor discharge stud welding may cause welding arc and metal spatter; therefore, operator must wear appropriate safety goggles and clothing. Exposed skin may result is burns.
(4) Before welding, confirm there are no flammable materials work areas.
(5) The machine must use certified stud screws (from dealer). Alternate studs may cause damage.
(6) Power switch must be in "OFF" position when not in use as capacitors store electrical energy.
(7) Power switch must be in "OFF" position when connecting or removing the cables of the machine.
(8) Power switch must be in "OFF" position for 5 minutes before starting work. This is minimum required time to fully discharge capacitors. Maintenance should be performed by professionals only.
(9) Please contact the manufacturer in the following situations: mechanical failure, reduce or increase torch cable length, damage to any component and any change the standard equipment.

2-2. AL & Steel CD Spot Welding

2-2-1. AL Stud Welding

Set-Up UNI-9804 (M4) or UNI-9806 (M6) collets





1. The stud pressed onto material - Compression

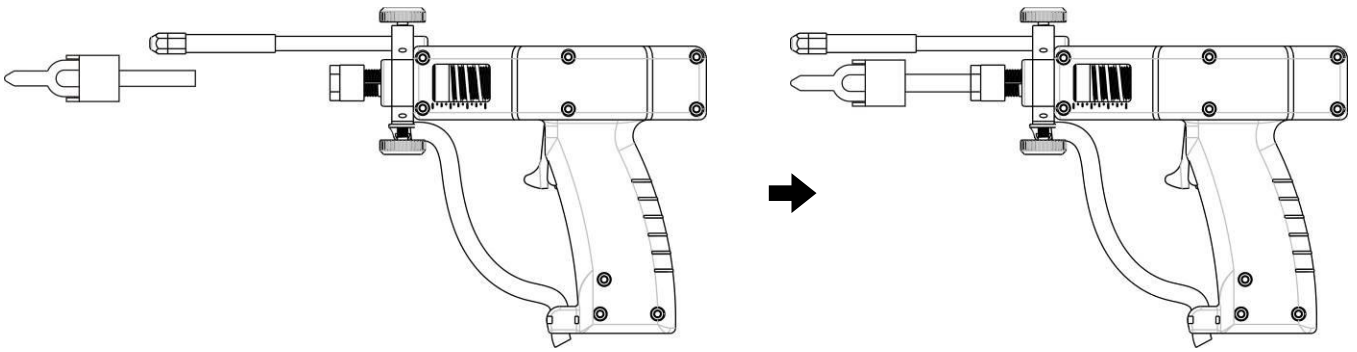
2. Capacitor discharge arc melts pin into puddle

3. Completed AL stud weld

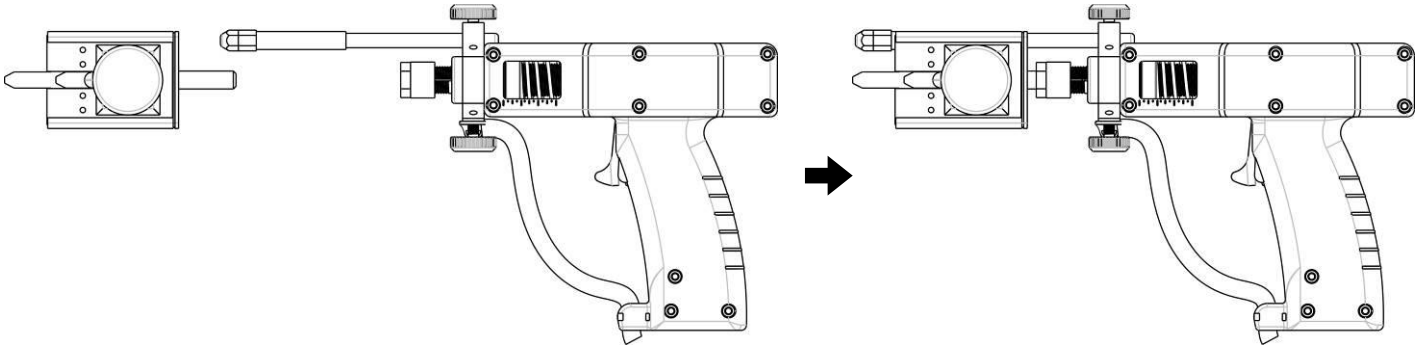
Capacitive discharge aluminum stud welding requires specially designed CD-Studs with arc-tip heads. CD stud welding requires very clean and smooth (120 GRIT) surface. The process requires the correct extension from the chuck collet, the correct amount of downward pressure to “push” the stud into the weld pool (torch head spring setting) along with the correct amount of current (machine power setting) to create the weld pool. If any of these variables are incorrect for the stud being used, it will not adhere to surface.

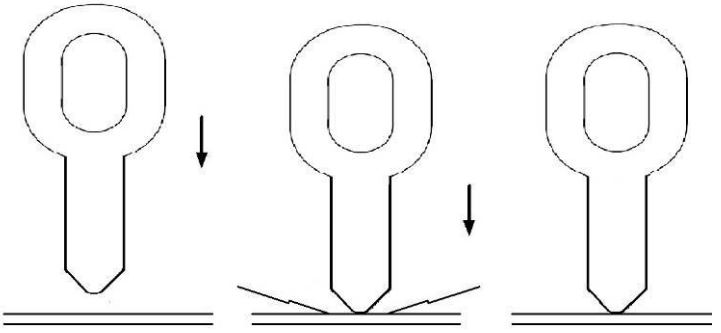
2-2-2. Steel Spot Welding

Set-Up UNI-9706 Tab key holder



Set-Up UNI-9600 Tab Shooter Tool

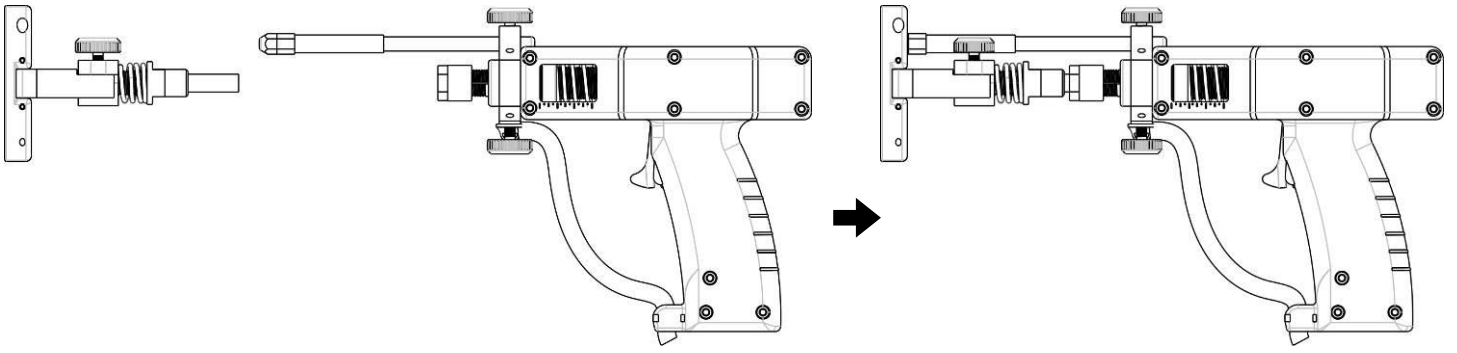




1. Washer contact to work piece **2. Discharge-power** **3. Finish welding**

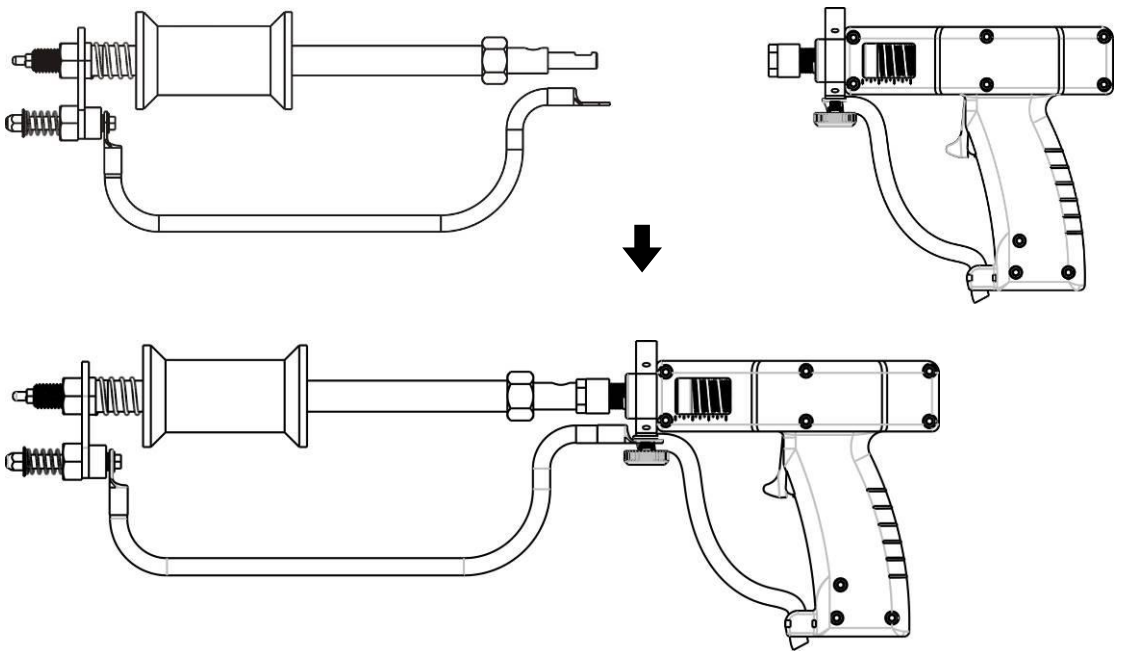
Capacitive discharge steel stud welding requires specially designed UNI-1061 or UNI-1062 pull tabs. CD stud welding on steel requires the correct pressure and power setting to “weld” to the surface of the panel but, due to the extremely short cycle time, there is no distortion, burn-through or oxidation on reverse side of panel. Given this control, the CD weld is not as strong as traditional transformer resistance weld but is adequate to pull deformity from panel with correct tools.

Set-Up UNI-9705 Mini Dent-Stick Puller (optional)

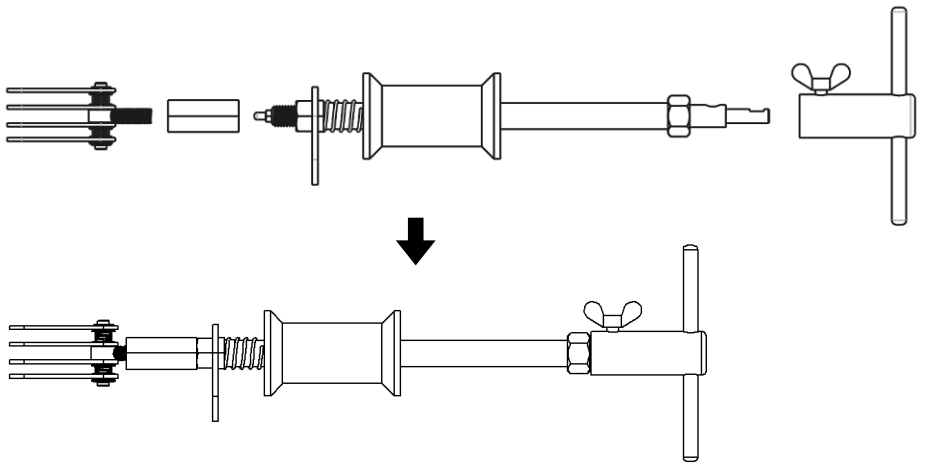


Set-Up UNI-9516 Slide Hammer

1)



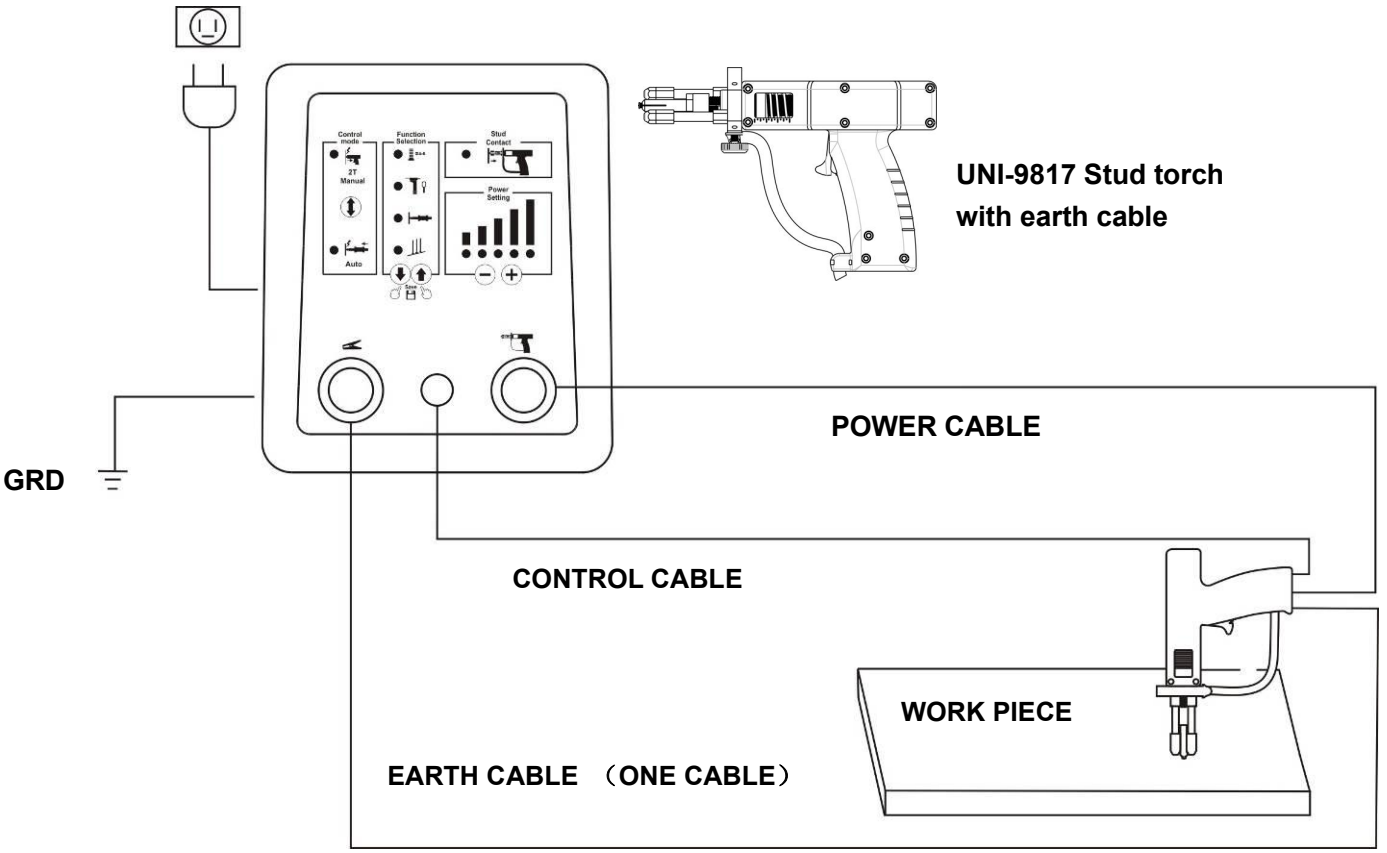
2)



UNI-9516 Slide Hammer w/o earth tip extension
UNI-9520 Earth tip extension with cable assembly
UNI-9521 Claw puller attachment, 4-finger
DTK-8004 Weld-Tip

3. Cable Connections

1) For stud welding/spot welding-torch with earth cable



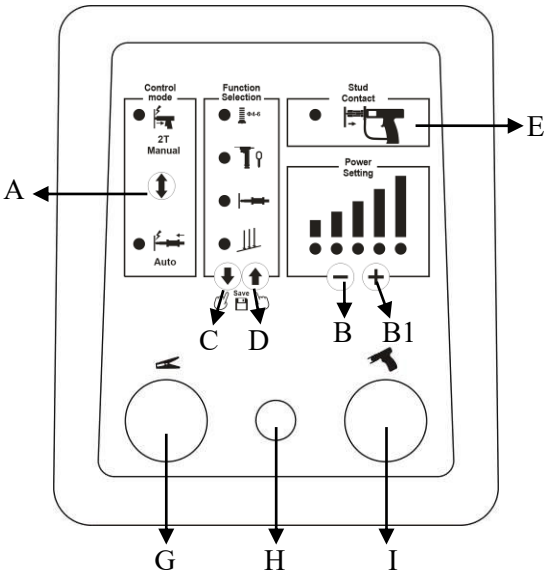
4. Operation:

The machine is different from traditional spot welder as it uses patent capacitor discharge power source design. The peak output current is over three times of traditional welder but the welding current is reduced to several milliseconds so it can greatly reduce welding heat on the body panel which reduces distortion, dis-coloration and oxidation; however, if the output circuit has poor contact, it may burn black the work piece or arc. Given this “burst” of high power, the stud head and earth tips require positive contact to the surface to “set” the stud correctly. Please note the following suggestion:

1) Remove all paint and contamination from weld area using **100-grit or higher** for finish before welding.
2) Earth tips on torch head must make full contact. Use two earth contacts, when aluminum stud welding.
3) Clean the stud head and earth tip(s) with a wire brush just prior to welding.
4) When using puller slide hammer, be sure to tighten all parts and apply weld-tip with pressure on panel.
5) Apply even pressure to the stud, tab or weld-tip onto the panel to insure full contact prior to welding. Any “gaps” or loose connections may create an arc that will diminish the power to the weld point.

WARNING: ARCs or SPARKs are a sign of poor connections and will result in poor welds.

5. Control Panel



A—There are two modes to select

Auto mode: The torch and earth cable Fire-On-Contact with the panel. Designed only for slide hammer use!

Manual mode: The torch trigger controls machine output.

Note: If Auto **or** Manual LED is flickering, machine is recharging and cannot output power.

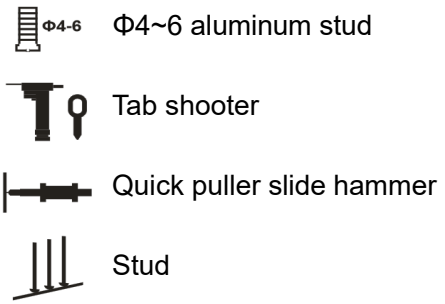
If Auto **and** Manual LEDs are flickering together, machine is in over-heat protection and cannot output power. Machine will auto-reset and LED's will light constantly.

B/B1—Power Adjustment

The higher the lamp level indication, the higher the output power. This will automatically be set by Function Select (below) but may be adjusted (+) or (-) according to operator preference.

C\D—Function Select and save

Select by welding modes and the system will automatically set the power level (Factory setting) and indicate on display.
Change Factory Preset: Press C & D at the same time (indicator will flicker for three times) to confirm SAVED.
Factory Reset: Select mode and press B & B1 at the same time (indicator will flicker for three times) to restore.



E— Stud Contact

LED will illuminate when stud & earth contact panel and compress torch head spring. No light, no trigger function.

G— Earth Cable

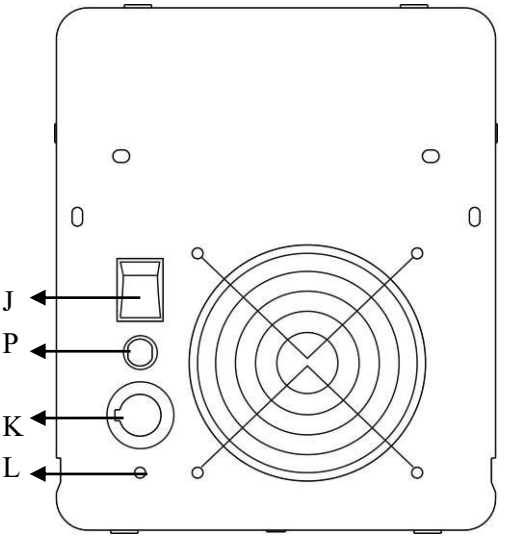
Install earth cable plug & twist to securely lock.

H— Control Cable

Install control cable plug and tighten ring

I— Torch Power Cable

Install torch power cable plug & twist to securely lock.



J— Power Switch

Main power ON/OFF switch.

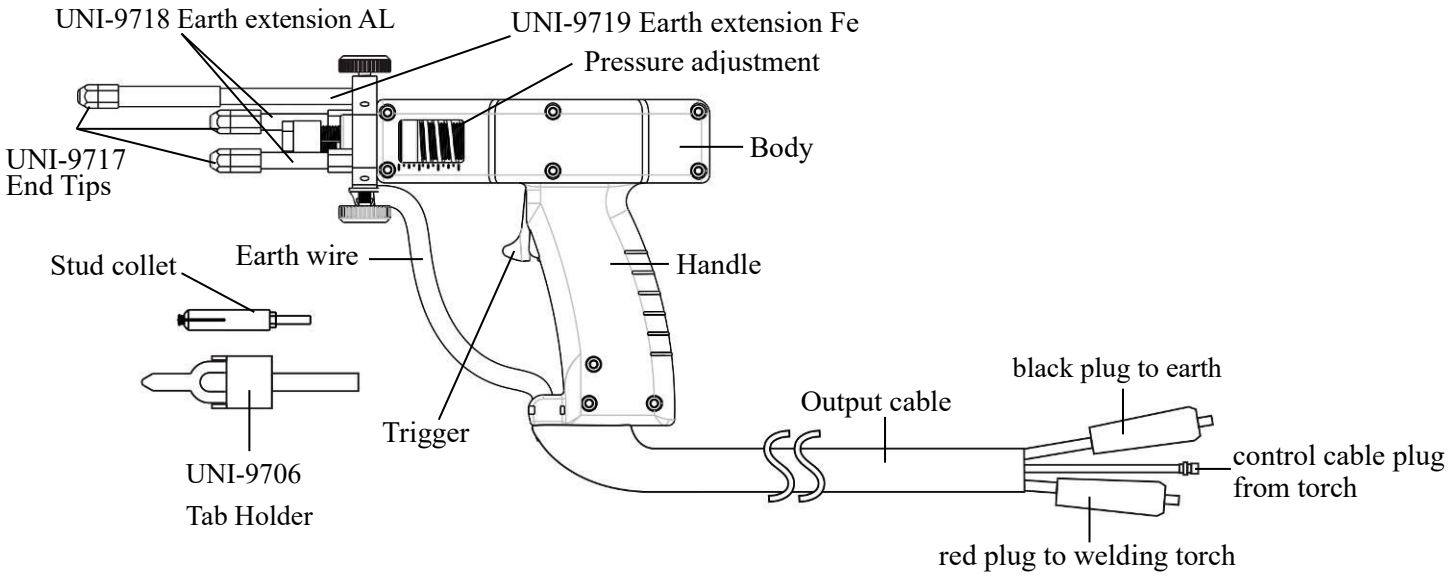
K— Input Power Cord

Connect to LINE circuit at rated input voltage

P— Main Fuse

Factory installed 15-amp fuse for electrical safety.

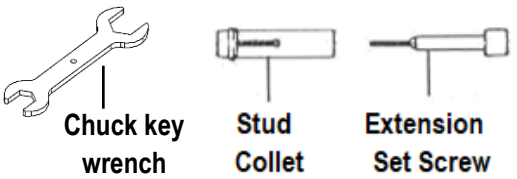
6. Stud Welding Torch Operation



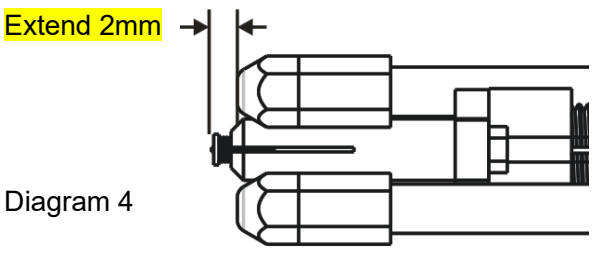
Stud collet or tab tip holder or slide hammer shaft installed into chuck and tighten.
Earth tip extensions, with tips, into earth collar. Two tips for aluminum. One tip for steel
Set pressure with adjustment wheel.
Pull trigger to weld stud or tab to panel.
Remove torch from stud or tab to pull dent

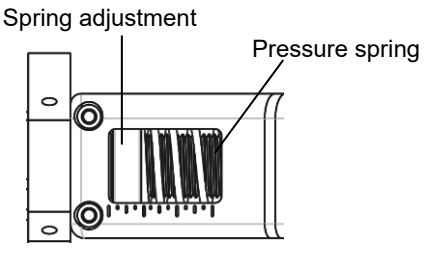
6-2-1 Set-Up Stud Collet

1. Chuck wrench will loosen collet body.
2. Insert aluminum stud & turn screw until stud head extends 2mm from face of collet body.
3. Tighten lock nuts on extension screw.
4. Insert collet body flush with earth tip heads

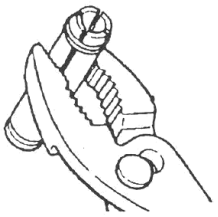


6-2-2 Adjust the pressure and extend distance





1. **Install collet body flush with earth pins so stud extends 2.0mm beyond earth pins.**
2. **Turn spring adjustment knob to set weld pressure. Stud weld heat increases as the torch pressure is reduced.**
3. **Factory spring setting should be adequate for standard operation.**



Over time with insertion of many studs, the collet body jaws will expand and cause the stud to be loose in the collet. Use pliers to clamp collet jaws closed for good contact. This can greatly extend life of the stud collet body.

7. Operating Process for Stud Welding

WARNING: Where safety glasses, gloves and appropriate clothing before use!

7-1 Preparation for Operation

(1) Keep the work piece free of dirt, oil, paint and rust. Use **100-Grit** or smoothed to finish surface.

(2) If the base metal is thin, it may deflect under pressure so add a backing plate when stud welding.

(3) Select suitable stud type (Al/Mg or Al/Si) and diameter for the required repair.

(4) Make sure the diameter of the collet is correct and the ***length of the stud stick-out*** is correct.

(5) Make sure all the cables are securely connected and torch contact points are in contact with work piece.

(6) Plug into line power and turn power switch to ON position.

7-2 Operating Stud Welding System

(1) Insert the correct type of pulling stud screw into stud collet body.

Note: Make sure the stud screw inserted with 2mm stick-out and adjustment screw is tight.

(2) Keep earth support feet in contact with the base metal. The torch presses on base metal.

(3) Press torch trigger: Discharge→Stud welding complete.

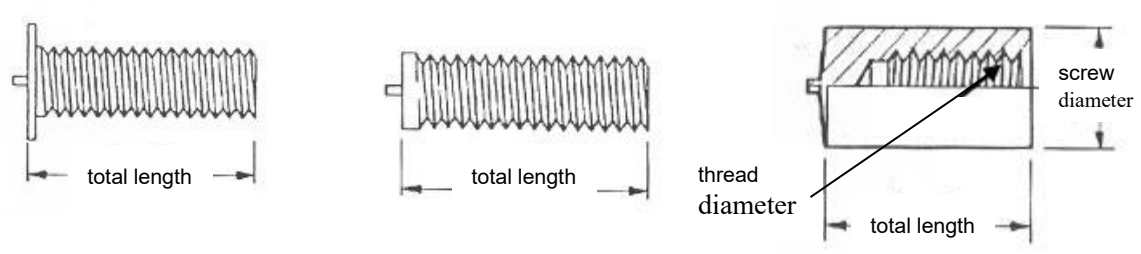
(4) Lift torch STRAIGHT off surface being careful not to deflect stud or tab.

Test stud weld to confirm pull strength before repeating the process along the dent.

8. Stud Pull Screw Styles

TYPE: mild steel, stainless steel, aluminum, titanium (Ti), brass or copper

TYPES: FLANGE STUD TAPPED

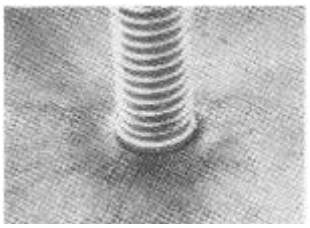


DIMENSIONS: outside thread-------- thread diameter * total length

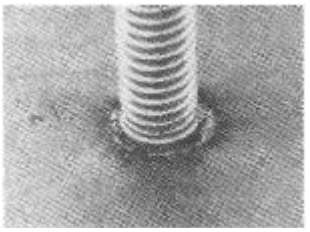
internal thread --------screw diameter * total length - thread diameter

9. Stud Welding Visual Test

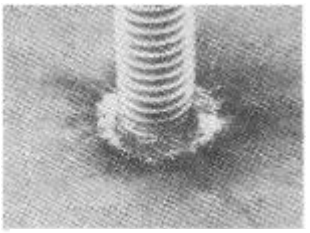
Please refer to the picture as follow, and assessment the stud welding results.



1.Voltage not enough



2.Correct voltage



3.Too high voltage

The following situations may cause inferior welds:

(1) Stud screw extends too long or too short from the stud clamp. (Correct “stick-out”)
(2) The earth legs and the metal are not good connection. (**Clean tips** and base material)
(3) Torch cable or earth cable is loose in machine connectors. (Twist until tight)
(4) The diameter of stud and collet are not a match. Or the collet is worn. (Replace collet)
(5) The base metal is dirty, rusty, and/or surface is not smooth causing interfere with conductibility.
(6) The stud is not suitable for the base metal. (check material & stud type to match)
(7) The stud screw and the base metal are not good connection (Keep the stud screw connect the base metal vertically. Do not contact flange with base metal, only pin head).
(8) The stud welding voltage is not correct. (Increase or decrease as required)
(9) The capacitor is damage or capacitance is not enough. (Replace capacitor)
(10) Welding torch movement is mis-aligned. (The support feet must be even and square)
(11) Base metal distortion or moves when welding. (Support material)

10. Machine Trouble Shooting

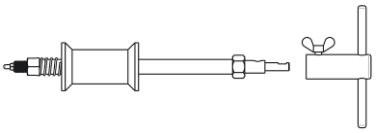
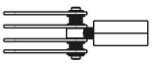
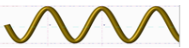
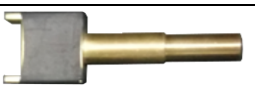
The machine is equipped with three protection functions:

1) Over-Heat Protection: There is a power transformer inside the machine with a snap-disc thermal switch. The temperature of the transformer will rise during operation. In the event it overheats, the “auto” and “manual” indicators will illuminate on front panel, and the machine will not function. The machine duty cycle is adequate approved operation so, If the machine overheats, please check the cooling fan.
2) Short Circuit Protection: If the torch and earth cable are kept in short circuit condition, the machine will not recharge. The torch and earth cable circuits need to be OPEN for the machine to recharge.
3) Over Current Protection: The power supply is protected by a Buss fuse located on back panel. If machine will not power up, check and replace the fuse. In the event it fails again, please contact service department.

GENERAL MAINTENANCE TIP

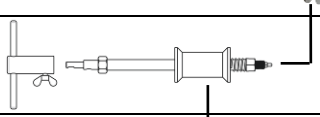
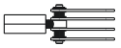
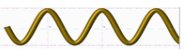
All components that contact the panel surface (i.e.: studs, tabs, washers, etc.) must be clean of any oxidation or contamination; therefore, cleaning with wire brush or Emery cloth will extend life.

ACCESSORIES LIST

POS.	CODE NO.	DESCRIPTION	QTY	PICTURE
1	UNI-9516	Slide Hammer w/ T-Handle	1	
2	UNI-9520	Weld-Tip Extension w/ Earth Cable	1	
3	UNI-9521	Claw 4-Finger w/ M14 Mount	1	
4	DTK-8004	Slide Hammer Weld-tip M5	1	
5	UNI-2101	Wiggle Wire 1 Lb. (0.5kg)	32	
6	UNI-2110	Spot Wire Tip	1	
7	UNI-1001	2.2 UNI-STUD Flexpert	25	
8	UNI-1002	2.6 UNI-STUD Flexpert HD	25	
9	UNI-1004	Spot Stud Tip	1	
10	UNI-9523	Tab Holder Extended 60mm	1	
11	UNI-1005	Molding Rivet Tip	1	
12	UNI-9524	Tip Holder Extended Tapered	1	
13	UNI-9804	Stud Collet M4	1	
14	UNI-1242	Stud screw M4*15 (#6061) Al/Si	100	
15	UNI-1142	Stud screw M4*15 (#5052) Al/Mg	100	

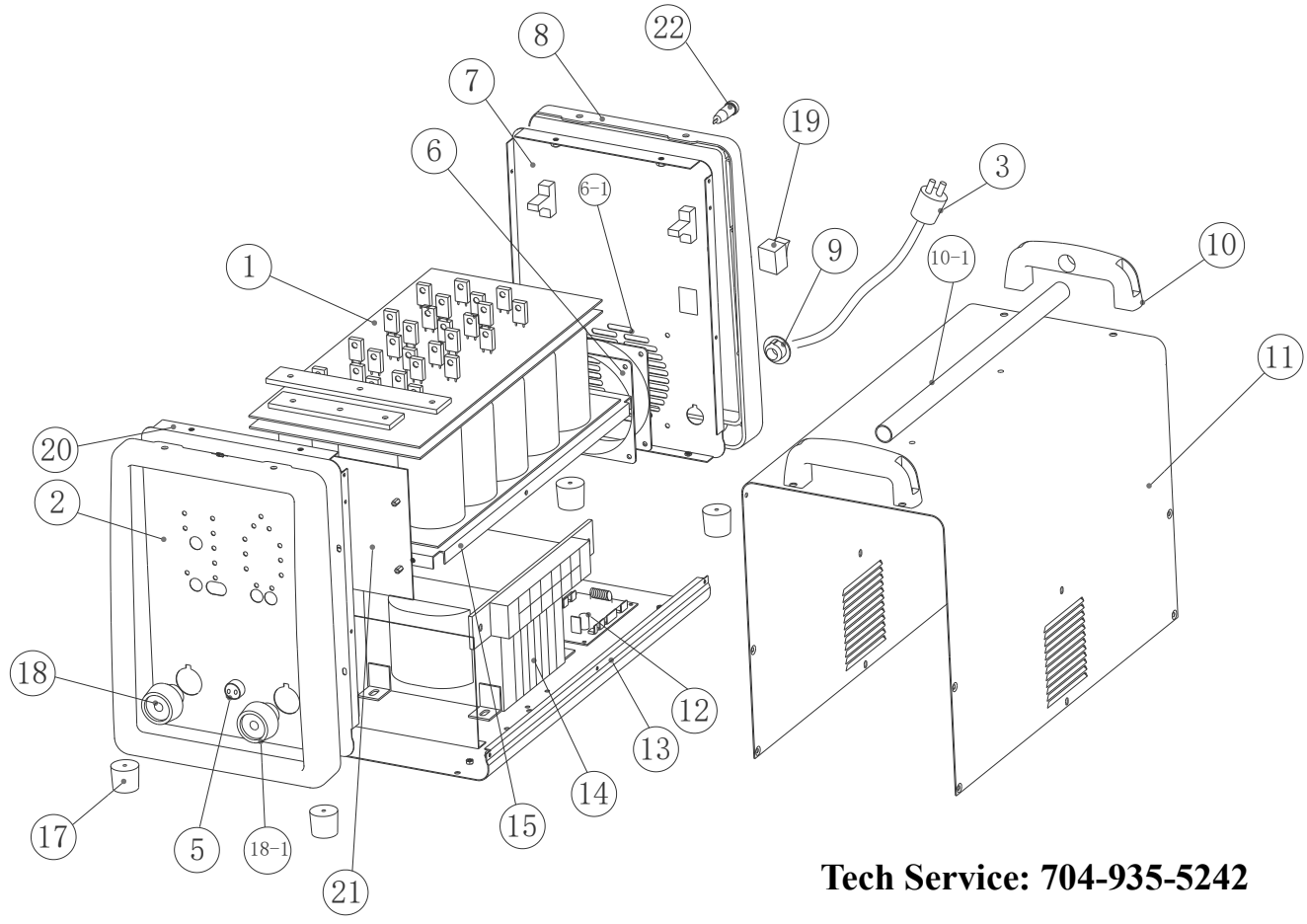
16	UNI-2040	Spot Pull Tab M4 Swivel Type	10	
17	UNI-9806	Stud collet M6	1	
18	UNI-1262	Stud screw M6*16 (#6061) AL/SI	100	
19	UNI-1162	Stud screw M6*16 (#5052) AL/MG	100	
20	UNI-2060	Spot Pull Tab M6 Swivel Type	10	
21	UNI-1061	Pull Key Tab Straight	25	
22	UNI-1062	Pull Key Tab Twist	25	
23	UNI-9716	CD Chuck Wrench 14mm * 10mm	1	
24	UNI-9600	Tab Key Shooter Tool	1	
25	UNI-9817	CD Gun w/ Dinse Cable	1	

INSTRUCTION FOR CONSUMABLES USAGE

	CODE	DESCRIPTION	QTY
	UNI-9705	Dent Stick Puller	optional
	DTK-8004	Slide Hammer Weld-tip M5	1
	UNI-9516	Slide Hammer w/ T-Handle	1
	UNI-9520	Weld-Tip Extension w/ Earth Cable	1
	UNI-9521	Claw 4-Finger w/ M14 Mount	1
	UNI-9524	Tip Holder Extended Tapered	1
	UNI-1001	2.2 UNI-STUD Flexpert	25
	UNI-1002	2.6 UNI-STUD Flexpert HD	25
	UNI-1004	Spot Stud Tip	1
	UNI-1005	Molding Rivet Tip	1
	UNI-9706	Tab holder	1
	UNI-1062	Pull Tab Twist	25
	UNI-1061	Pull Tab Straight	25
	UNI-9600	Tab Shooter Tool	1
	UNI-2110	Wire tip with groove	1
	UNI-2101	Wiggle Wire 1 Lb. (0.5kg)	32
	UNI-9804	Stud Collet M4	1
	UNI-1242	Stud screw M4*15 (#6061) AL/SI	100
	UNI-1142	Stud screw M4*15 (#5052) AL/MG	100
	UNI-2040	Spot Pull Tab M4 Swivel Type	10
	UNI-9806	Stud Collet M6	1
	UNI-1262	Stud screw M6*16 (#6061) AL/SI	100
	UNI-1162	Stud screw M6*16 (#5052) AL/MG	100
	UNI-2060	Spot Pull Tab M6 Swivel Type	10

EXPLODED PARTS LIST MODEL 9802-03

No.	Part No.	Description	No.	Part No.	Description
1	597N5830	PCB drive & capacitor	13	EY11244C1X0101G5	bottom panel
2	597N5839	front panel 9802-03	14	VT091062-2	main transformer
3	707.0121	115VAC power cord	15	EY11244C1Z0101+	inside panel
5	175N9037	control socket	17	530.0025	rubber foot
6	530.0024	fan	18	511N0014	quick socket
7	EY11244H0101B1	back panel	18-1	511N0014R	quick socket-red
8	597N5312	plastic frame	19	530.0020	main switch
9	707.0175	strain relief	20	EY11244-CQ0101B1	front panel
10	540.0018	handle	21	597N5831	control board
10-1	540.0017	steel tube for handle	22	526.0036	fuse 15A
11	EY11244C1S0101G5	top cover		597N5913	fuse holder
12	597N5813	power board	23		



Tech Service: 704-935-5242