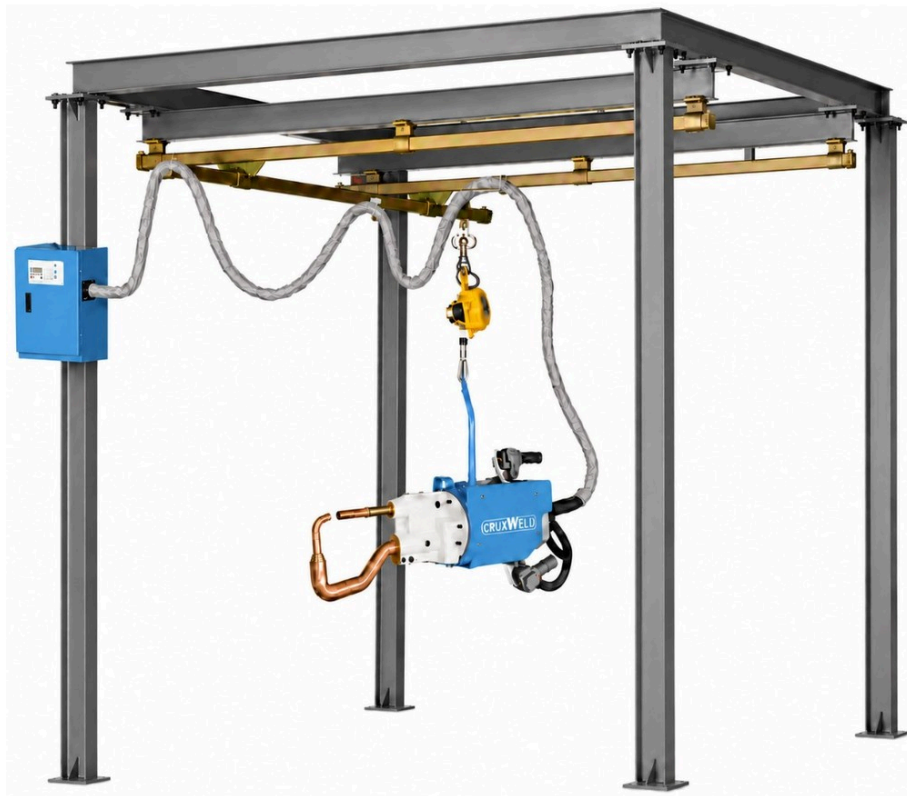


AeroSpot 35

Pneumatic Hanging Spot Welding Machine

Integrated Suspended Spot Welder | 35 kVA | C-Type Gun | Water Cooled



OPERATION MANUAL

Read this manual carefully before installing and operating the machine.

Cruxweld Industrial Equipments Pvt. Ltd.
5, Sector 29, Faridabad - 121008 (Haryana), India
Phone: +91 8800 882 983 | +91 (129) 489 2868
Email: sales@cruxweld.com | Service: support@cruxweld.com
www.cruxweld.com

Contents

I. Product overview	3
II. Main technical parameters	5
III. Operating principle and structure	5
IV. Installation and adjustment	8
V. Start and stop	11
VI. Use and maintenance	12
VII. Safe operations and precautions	13
VIII. List of accessories	14

Attached figures

Fig.1 Diagram of the Air Passage (Pressurization) System

Fig.2 Diagram of the Water Passage (Cooling) System

Fig.3 Basic Types of Welding Tongs

Fig.4 Switch Layout of the Operating Handle

Fig.5 Installation Diagram of the Spot Welder

Fig.6 Diagram of the Rear Cover of the Welding Transformer at the Rear of the Spot Welder

I. Product overview

1.1 Purpose and characteristics

The spot welder is movable while workpieces are fixed during machining. It is mainly used for the welding of carbon steel sheets, coated steel sheets and stainless steel sheets that cannot or are inconvenient to be welded by common stationary welding machines. With a welding thickness of 0.5+0.5 to 2.5+2.5 (mm), it is applicable to the welding of vehicles, cabinets, buildings and other industries. It integrates the three parts of a spot welder (welding transformer, welding tongs and water cooled cable). It has the characteristics of compact structure, convenient and flexible operations, effective and energy-saving operation and high safety and reliability and can realize omnibearing welding.

1.2 Model designation

The model designation of this product is AeroSpot 35: Cruxweld AeroSpot series pneumatic hanging (integrated suspended) spot welder with a rated capacity of 35 kVA, AC power frequency type, fitted with a C-type welding gun.



Cruxweld AeroSpot 35 hanging spot welder on its spring balancer

Note: To meet different operating requirements, the products of the same model may have different welding tongs characteristics and be distinguished from each other through the welding tongs type (C type, as fitted to the AeroSpot 35, or X type). Please do identification and selection according to the content of the manual of the welding tongs.

1.3 Operating conditions

1.3.1 Altitude: max. 3000 m

1.3.2 Temperature of the incoming cooling water: 5-30°C

1.3.3 Ambient temperature: 5-40°C

1.3.4 The place where a spot welder is used should have no harmful gases, steam, salt mist, chemical deposits, dust, mould or other explosion or corrosive mediums and be free from both violent vibration and bumping.

1.3.5 The pressure of the incoming cooling water should ensure a flow rate necessary for the spot welder and the water quality should comply with the requirements for industrial water.

1.3.6 Power supply: AC 380 V, 50 Hz

Voltage fluctuation (rated frequency): $<\pm 10\%$

Frequency fluctuation (rated frequency): $<\pm 2\%$

II. Main technical parameters

Technical parameters - Cruxweld AeroSpot 35			
Model	AeroSpot 35	Distance between arms	160 mm
Welding gun type	C type, pneumatic	Max. welding thickness (mild steel)	2.5 + 2.5 mm
Rated capacity	35 kVA	Cooling	Water cooled, approx. 4 L/min
Power supply	380 V AC, 50 Hz, single phase	Compressed air consumption	approx. 5.4 m ³ /h
Rated duty cycle	50 %	Transformer insulation class	Class F
Power at 50 % / 25 % duty	25 kVA / 30 kVA	Welding gun weight	approx. 55 kg
Max. secondary short-circuit current	14 kA	Overall dimensions (gun)	approx. 850 x 470 x 320 mm
Electrode pressure (0.4 - 0.5 MPa air)	approx. 2300 N	Suspension	Spring balancer
Standard arm length	300 mm	Cable and hose length	10 m

Notes: 1) During the calculation of the electrode pressure, the inlet air pressure is taken as 0.4Mpa to 0.5Mpa.

2) The air consumption is a reference value at 100 welding cycles per minute (it is a reference value).

3) The maximum short-circuit current refers to the current when a standard short circuiting ring is used for the secondary coil of the welding transformer.

III. Operating principle and structure

3.1 Operating principle

First, put a workpiece between the electrodes of the welding tongs. Then start the operating travel switch of the spot welder. After that, the “Pressurize” program will start to run, the air electromagnetic valve will start to operate and the compressed air will enter the air cylinder of the spot welder to make the electrodes of the welding tongs act to make the workpiece

compact. After a proper delay, the “Weld” program will start to run. At this time, the primary coil of the welding transformer will be connected with the power supply through the controllable conduction of the silicon controlled rectifier and the secondary coil will generate a welding current for the welding of the workpiece. After the “Weld” program is completed, the primary coil of the welding transformer will be disconnected and the spot welder will enter the “Maintain” program. After some time of pressure maintenance, the air electromagnetic valve will get disconnected, the welding tongs will release the workpiece and the spot welder will enter the “Rest” mode. It is by then that a welding cycle is ended.

The time control of all the programs during the operations of the spot welder (such as “Pressurize”, “Weld” and “Rest”) is completed by a timer in the spot welding controller. The duration of each of the said programs and the welding current (namely the “welding specification”) should be set in advance.

3.2 Structure

The spot welder consists essentially of a welding transformer, an air passage (pressurization) system, a water passage (cooling) system, a pair of welding tongs, an operating handle and a rotary rack and is equipped with a spot welding controller.

3.2.1 Welding transformer

It is of single-phase shell type and sealed by epoxy resin. Its primary coil is a disc winding and its secondary coil is a special rectangular pipe that is used as a water cooling device at the same time.

3.2.2 Air passage (pressurization) system

It consists essentially of a compressed air filter, a reducing valve, a barometer, an oil atomizer, an air electromagnetic valve, an air cylinder and operating switches. The air cylinder has two travels: The smaller operating travel is used for workpiece welding by the electrodes and the bigger auxiliary travel for making it convenient to place a workpiece between the two electrodes. The two travels are controlled by the operating switches at the upper and lower parts of the operating handle respectively. See Fig.1 for the diagram of the air passage (pressurization) system.

3.2.3 Water passage (cooling) system

The rear part of the spot welder is provided with a general water inlet pipe and a general water outlet pipe. The incoming water is divided into two passages by a distributor block. One of the two water passages is connected with the water pipe of the welding transformer to make the welding transformer cool down and the other is connected with the two electrodes to make them cool down. See Fig.2 for the diagram of the water passage (cooling) system.

3.2.4 Welding tongs

The welding tongs consists essentially of two electrode arms and an electrode tip. Water flows through the interior of the welding tongs to make the electrode tip cool down fully. The two electrode arms are connected with the secondary coil of the welding transformer through a flexible copper strip for the passing of the welding current. The welding tongs may be of X type or

C type. See Fig.3 for the basic types of the welding tongs. There may be many types of the welding tongs for different welding objects.

3.2.5 Operating handle

It is mounted on the air cylinder of the spot welder and provided with a welding (operating travel) switch and an auxiliary travel switch to meet the needs of welding operations. See Fig.4 for the switch layout of the operating handle.

3.2.6 Rotary rack

It is mounted on the body of the spot welder and connected with the balancer to make the spot welder rotate forward, backward, leftward and rightward and move horizontally and to meet the requirement of the spot welder for omnibearing welding.

3.2.7 Spot welding controller

The AeroSpot 35 is supplied with a Cruxweld microcomputer spot welding controller (separate control box) matched to the welding transformer.

See the Operation Manual of Spot Welding Controller for the information about the spot welding controller.

IV. Installation and adjustment

4.1 Installation

4.1.1 Install and connect the spot welder according to the Installation Diagram of the Spot Welder (Fig.5) and the Diagram of the Rear Cover of the Welding Transformer at the Rear of the Spot Welder (Fig.6).

4.1.2 Hang the spot welder securely on the balancer and make sure it can turn and run freely.

4.1.3.1 Connect the water source switch and the general water inlet nozzle (see the sign) at the rear of the spot welder, the general water outlet nozzle (see the sign) and the water inlet nozzle at the rear of the spot welding controller and the water outlet nozzle and the drainage ditch or the circulating water tank in order through water hoses.

4.1.3.2 The water hoses should be clamped with the water inlet and outlet nozzles through dogs.

4.1.3.3 The water inlet has a pressure of about 0.3Mpa and a flow rate smaller than 4L/min.

4.1.4 Air passage installation

4.1.4.1 Install the air filter, the pressure regulator and the triplet for air source treatment on the side of the controller or another position which the user thinks is proper and feed some 10# engine oil into the oil atomizer.

4.1.4.2 Connect the air source switch and the joint of the air filter and the joint at the outlet of the oil atomizer and the general air inlet pipe (see the sign) on the distributor block at the rear of the spot welder in order through air hoses.

4.1.4.3 The air outlet of the electromagnetic valve may be installed with a silencer.

4.1.4.4 The air hoses should be clamped with the joints through dogs.

4.1.4.5 The pressure of the compressed air entering the air filter should be

not smaller than 0.6Mpa. The pressure of the compressed air used for the spot welder is selected by the user. Generally speaking, it is 0.3Mpa to 0.5Mpa.

4.1.5 Electric circuit installation

4.1.5.1 The entire electric circuit has been properly connected in the interior of the spot welding controller used with the spot welder. User can realize its external connection following the steps below.

4.1.5.2 Insert the ten-core cable plugs into the spot welding controller and the corresponding plug seat at the rear of the spot welder and lock them firmly.

4.1.5.3 Introduce two three-core wires from the primary coil of the welding transformer and connect them to connecting terminals X and B of the spot welding controller and then connect the ground wire with the terminal marked with “GND”.

4.1.5.4 Connect the incoming power line with the main power switch and connecting terminals A and B of the spot welding controller in order and then connect the ground wire with the terminal marked with “GND”.

4.1.5.5 The electric connection must be firm and reliable.

4.1.5.6 It is suggested to install a leakage protector at the incoming power line.

4.1.5.7 The ground wire must be separate and must not be replaced by other improper wires.

4. 2 Inspection and adjustment of the spot welder

4.2.1 Before using the spot welder, inspect the connection conditions of all of its bolt joints and tighten any loose screws and nuts.

4.2.2 After the spot welder is installed, inspect whether the electric circuit, the air passage and the water passages are correctly and securely connected or not according to related diagrams.

4.2.3 After the compressed air is connected, adjust the pressure selected as per the welding specification through the reducing valve.

4.2.4 Put the Adjust/Weld switch at the rear of the spot welder on the Adjust position and separately connect the welding (operating travel) switch or auxiliary travel switch on the operating handle and then inspect the motion conditions of all the parts of the spot welder and the centering condition of the electrode tip. If necessary, adjust the spot welder properly. If it is necessary to adjust the operating travel, do it on the corresponding adjusting mechanism at the joint between the movable electrode arm and the air cylinder (or replace the electrode tip with another one with a proper length).

4.2.5 Connect the water passage and inspect the incoming and outgoing water currents. If there is water leakage, unplug it; if water is not flowing smoothly, do corresponding inspections to make it smooth.

4.2.6 See the Operation Manual of Spot Welding Controller for the inspections and adjustments of the spot welding controller.

V. Start and stop

5.1 After installing, inspecting and adjusting the spot welder, connect the air

source and the water source and then put the Adjust/Weld switch at the rear of the spot welder on the Weld position.

5.2 Select the corresponding welding specification according to the specific welding object (it depends on the function of the spot welding controller equipped), adjust the pressure of the air source and set the specification selector switch at the rear of the spot welder on the specification level selected (specification A or B): Specification A when the said switch is pressed forward or specification B when it is pressed backward.

5.3 Put the adjusting knobs on the panel of the spot welding controller on the corresponding positions of the specification selected and connect the main power switch. It is by then that the spot welder will start the welding.

5.4 If the spot welder will not be used for a long time, its main power, cooling water and compressed air must be cut off.

5.5 If the spot welder will not be used for a long time, apply some antirust lubricant on its exposed mechanical parts.

VI. Use and maintenance

6.1 The spot welder should have enough water and a smooth water passage and should not suffer stop of water supply during its use.

6.2 When the spot welder is used, more than one fourth of the volume of the oil atomizer should be occupied by oil or else timely oil feeding should be

done.

6.3 If there is water in the air filter, loosen the screws at the bottom of the air filter promptly to discharge the water.

6.4 Do not make the spot welder barge about during its use.

6.5 Replace the grease of the bearings at regular intervals (once every half a year in general) (disassemble the spot welder partially) and inspect and maintain the connections of the water passages, the air passage, the electric circuit and the mechanical parts (this content should be done by experienced technicians).

6.6 Do frequent trimming for the electrode tip to ensure welding quality.

VII. Safe operations and precautions

7.1 The spot welder is connected with an AC380V power supply and safe operations must be done for it following the basic rules of technical safety protection.

7.2 The housings of the spot welder and the spot welding controller must be securely grounded and frequently inspected. Never replace the ground wires with other improper wires.

7.3 Do not inspect or maintain the spot welder until the main power switch is cut off.

7.4 When the ambient temperature is lower than 5°C, try to remove the water in the cooling water passages to avoid the fracture of the cooling water pipes in the spot welder and the spot welding controller. Do the same

thing if the spot welder will not be used for a long time, so as to avoid corrosion of parts. Make compressed air enter the water inlet of the spot welder to discharge the water thoroughly.

7.5 If the spot welder is wetted by leaking water, stop using it. After it is dried, use a 1000V megohmmeter to measure the insulation resistances of the electric parts of its welding transformer, the control switch and the electromagnetic valve toward its housing. Do not use the spot welder until the insulation resistances are higher than 2.5 megohm.

VIII. List of accessories

8.1 List of accessories

- a. AeroSpot 35 spot welder (one unit)**
- b. Cruxweld microcomputer spot welding controller (one unit)**
- c. Balancer (one unit. Equipped as specified in the contract)**
- d. Quick-wear parts delivered with the spot welder (see the packing**

list)

8.2 Documents and diagrams

- a. Operation Manual of AeroSpot 35 Spot Welder (one copy)**
- b. Operation Manual of Spot Welding Controller (one copy)**
- c. Manufacturer certificate (one copy)**

Fig.1 Diagram of the Air Passage (Pressurization) System

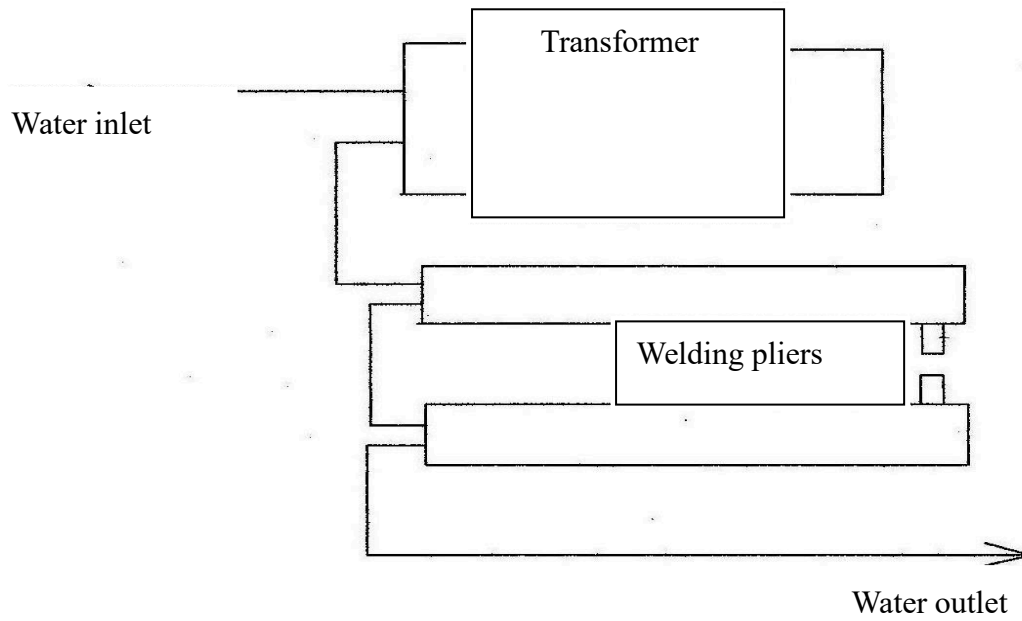


Fig.2 Diagram of the Water Passage (Cooling) System

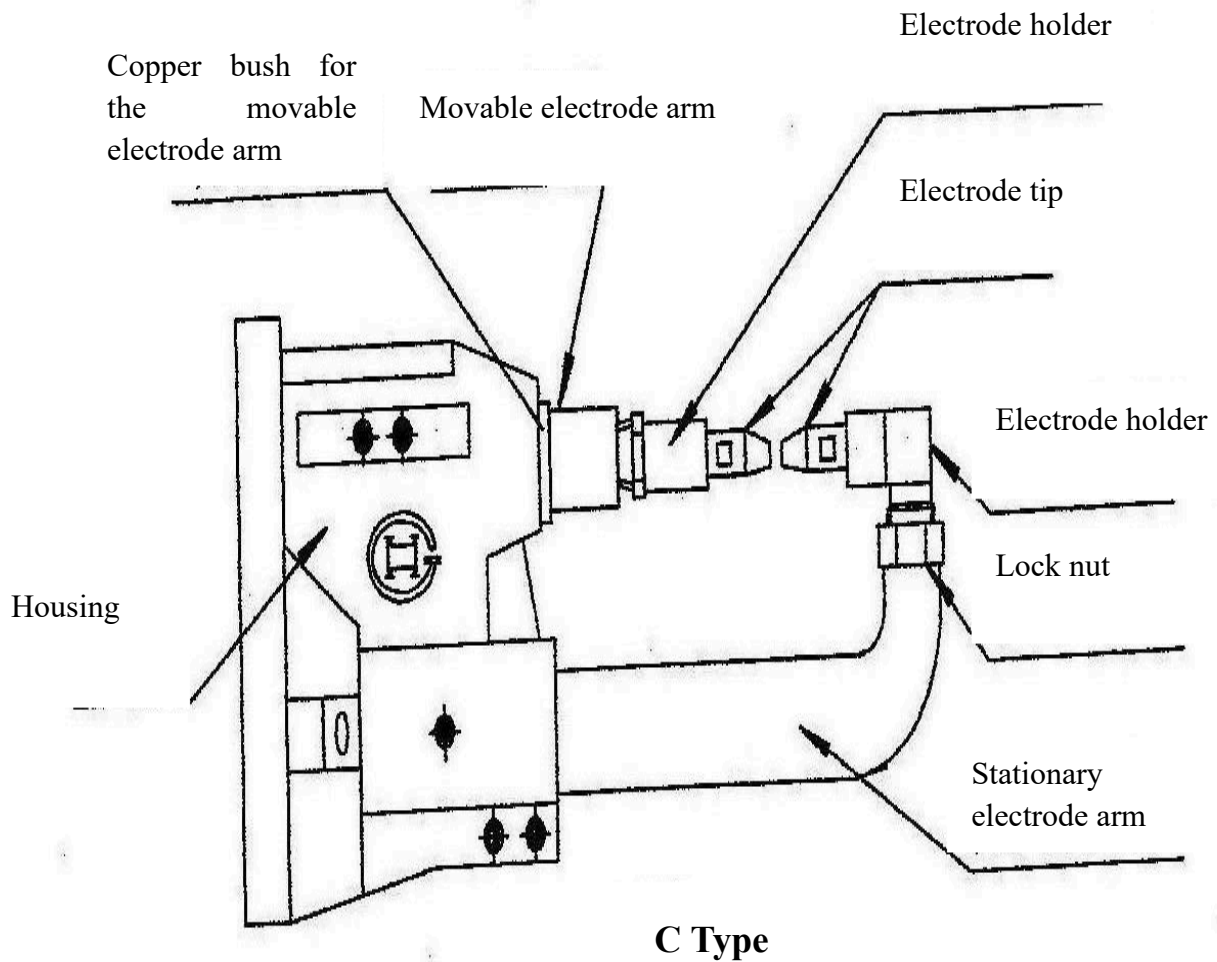


Fig.3 Basic Types of Welding Tongs

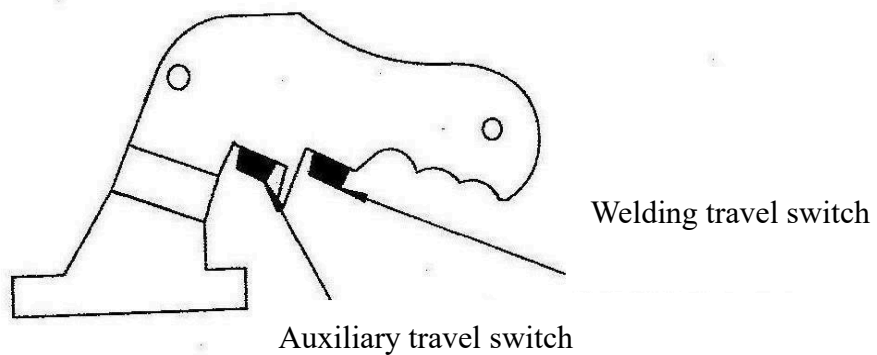


Fig.4 Layout of Operating Switches

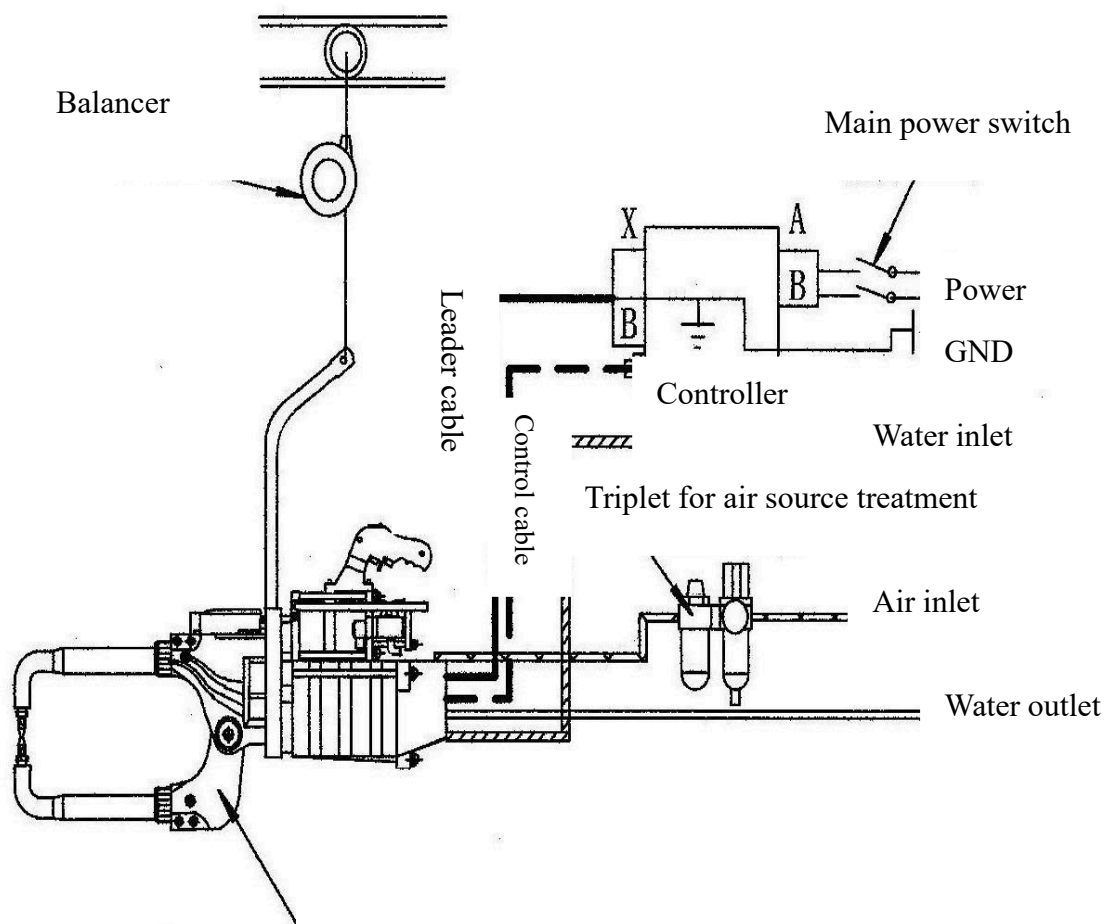


Fig.5 Installation Diagram of the Spot Welder

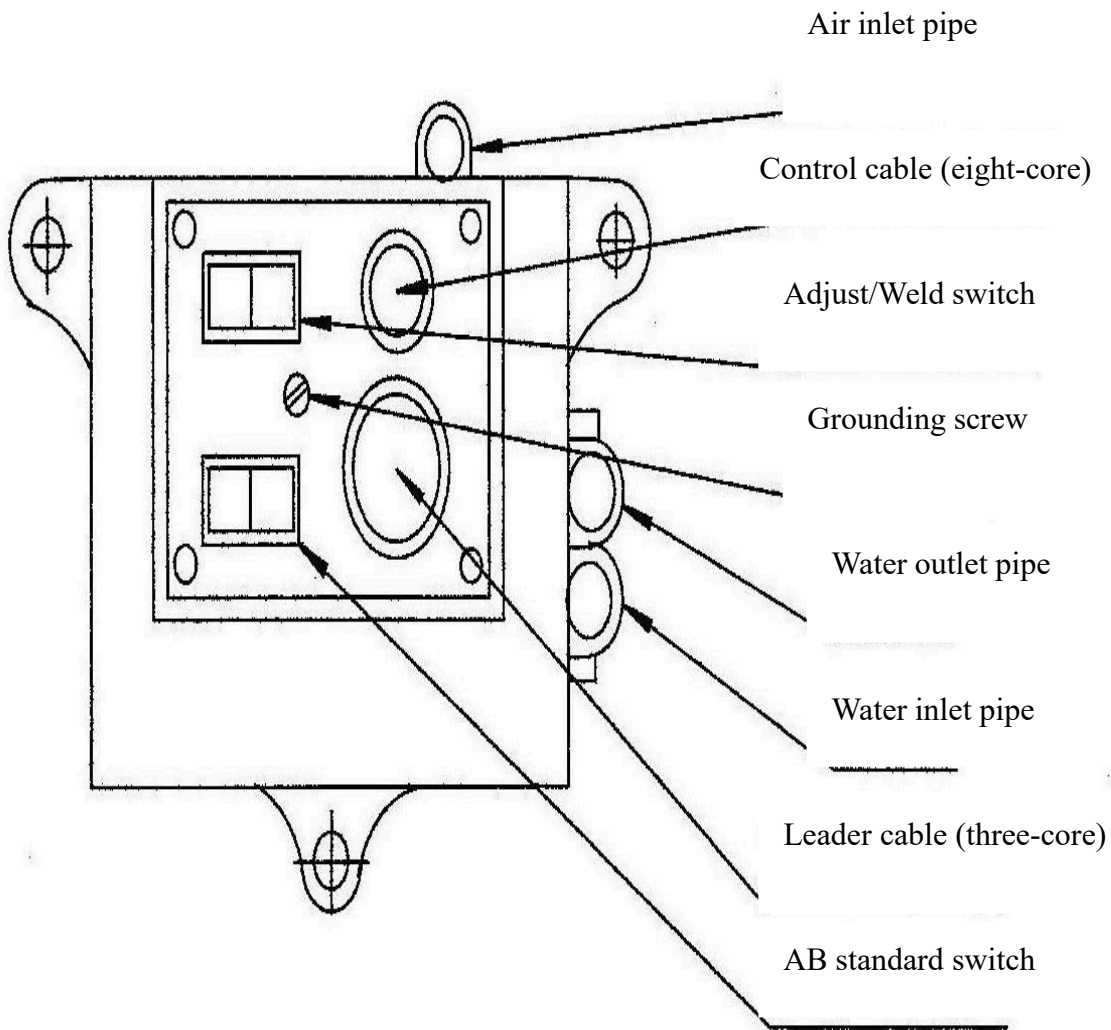
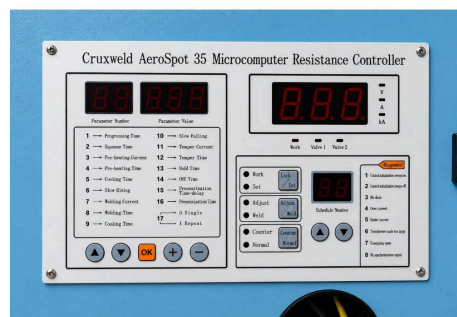
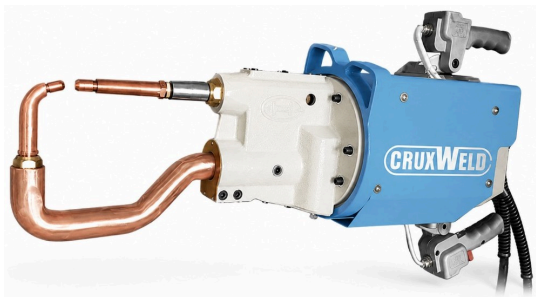


Fig.6 Diagram of the Rear Cover of the Welding Transformer at the Rear of the Spot Welder



Cruxweld AeroSpot 35 - Pneumatic Hanging Spot Welding Machine

Cruxweld Industrial Equipments Pvt. Ltd., 5, Sector 29, Faridabad - 121008 (Haryana), India
 Phone: +91 8800 882 983 | +91 (129) 489 2868 Email: sales@cruxweld.com | support@cruxweld.com
www.cruxweld.com