WESTKEN

THE WEST KENNETT CORPORATION

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"*UN35*" 35kVA BUTT WELDER

The 35kva "UN25" butt welder are general purpose air clamping, air upsetting butt welders fitted with a solid-state timer system capable of welding mild steel round material from 3mmdia up to and including 8mmdia. The transformer is thyristor controlled with thyristor protection circuits and systems in place. Current/heat control, air clamping pressure, upsetting pressure & upsetting stroke are all adjustable. Control voltage is 24vdc.

The machine has a CuCrZr copper upper clamping block and "V" cut to suit CuCrZr copper lower welding electrode. On delivery the lower electrode can be un-machined. There are two 63mmdia clamping cylinders and a 63mmdia upsetting cylinder. All air equipment, solenoids & FRL units are 1/4bsp. The machine has a semi encapsulated transformer which is water cooled. The machine is on a based lifter unit and can be supplied on a wheel base unit.

The machines are operated by a single foot switch with a latch system to operate the LH/RH clamping cylinders.

EXPLAINING THE AIR OPERATED BUTT WELDER SYSTEM:

Note: Please read this in conjunction with information on our website. ***www.westken.co.za***

Congratulations on your purchase of a "Westken" air operated UN35 Butt welder, marketed by "Westken" in Pretoria, South Africa. Westken manufactures and imports a full range of welding machines from the 25kva foot pedals up to 450kva Projection welder.

Westken, 190 van Eden crescent, Rosslyn, Pretoria, South Africa.
www.westken.co.za (Tel; +27 12 541 2188/9 or +27 12 541 6064/5)

All air operated butt welding machines use an air cylinder to close the welding electrodes together and to upset the welding area, whether it's the "UN35" or "Level-6 100kva butt welder the method is the same.

The welders utilize a technique called "Resistance Welding". Resistance welding is a process where metal is held between two electrodes, lots of amps (thousands) but low volts (3v – 10v) are pushed through the metal causing the metal to get hot and melt in between the electrodes. Then after the metal melts the supply of the amps is stopped allowing the metal to cool and bond. Once the metal is cool the electrodes let go of the metal and you have a weld.

The operator pushes the electric ***foot switch*** or, where fitted the two hands start switch, this switch triggers the welding timer to begin its process.

The first operation the timer undertakes is to send a signal to the air ***solenoid*** valve (air flow switch) to allow air to travel to the air cylinder. This pushes the piston in the cylinder down and closes the welding tips.

Once the tips are together the timer then switches the ***Thyristor switch*** (also call the ***SCR, AC switch, Semipack***) which allows electricity to flow into the transformer. The electricity coming into the transformer is normally 380vs at about 80amps. The ***transformer*** changes this (transforms) supply to about 4.5volts at 9000amps output.

Because the clamping electrodes are closed this AC volts/amps will pass through them and into the steel being welded causing the steel to heat up in the weld area. As the heated area starts to melt the upset air cylinder pushes the two parts together. This upsetting pressure ensures that when the weld takes place the wet metals combine to make a secure weld; this is called ***follow-up pressure*** or ***forging pressure***.

AN INTRODUCTION TO THE MACHINES:

We are now looking at the machine with its electronic device with its readout screens, lights and buttons; it's a bit confusing, hey! Read this and it will hopefully make things a bit clearer.

As stated above the air Butt welding machines are all similar but I will highlight machine specific parts and describe them in a bit more depth.

I will discuss timer setting which can be found further on in this manual. It is important that you have read the other sections concerning spotwelding and resistance welding, so now, once again, let's try and explain in a way that is understandable without using too many big words, technical terms, or baffling phrases.

Some simple explanations of words and terms can be found on our website. Words that can be found on our website will be in ***bold italics***.

A more in-depth explanation of the welding processes and equipment will be covered in other sections on the ***Westken*** info page.

CHAPTER ONE:

The layout and walk around of an UN35 air operated Butt welder.
(UN35 Butt welder)

1) *Front side of the machine*
2) *Right Hand side of the machine.*
3) *Rear of the machine*
4) *Left Hand side of the machine*
5) *Top of the machine.*

CHAPTER TWO:

The installation of a UN35 air operated Butt welder
Please read ***Introduction to Spotwelding for newcomers & others on our website***
(UN35 Butt welder)

1) *Bolting the machine down.*
2) *Cable sizes and fusing.*
3) *Water pipes.*
4) *Machine Fusing with supply cable not exceeding 10m*

CHAPTER THREE:

The operation of a UN35 Butt spot welder
(UN35 Butt welder)

1) *How the machine works allowing a weld to take place.*
2) *Basic startup setting of the timers on an air operated Butt welder.*
3) *The setup of the solid-state control as used on the UN35 Butt welder*
4) *Info for Customers purchasing spares.*

So you have seen what we want to discuss, it helps a bit if you know what machine you have, look at the list and away we go.

CHAPTER ONE:

The layout and walk around of a UN35 Butt welder.
(UN35 Butt welder)

1) *Front side of the machine*
2) *Right Hand side of the machine.*
3) *Rear of the machine*
4) *Left Hand side of the machine.*
5) *Top of the machine.*
6) *Electrodes and electrode clamps*
7) *Welding timers & Thyristors*
8) *Machine weights and footprint*

These machines are free standing welders. The UN35 machines use 380volt @ 50hz supply. All machines use water for cooling the transformer and thyristor.

(1) Front side of the machine:

Looking from the front of the machines you will see left hand and right-hand clamping jaws, foot switch on the floor, and the upsetting cylinder on the right-hand front. The timer control is located on the right-hand side cover. There are two hinged doors that allow access to the transformer.

The upper jaws have adjuster bolts which allow height adjustable for different material sizes. These machines have the lower electrodes fixed to the machine frame where there is adjusts for leveling lower electrodes. There is also visible the upsetting cylinder adjuster nut for fine tuning the upsetting travel but this is normally factory set to the clients specification.

Upper and lower basic electrode dimensions:

1) ***Upper electrodes*** 40mm high x 35mm wide x 25mm thick
2) ***Lower electrode*** 40mm high x 35mm wide x 25mm thick

(2) Right Hand side of the machine:

Moving around the machine to the right side you will find the timer control system and the factory fitted program select switch. On the lower side cover you will find the water inlet and outlet, earthing connection point and the electrical supply access point. The foot switch plug in connect can be seen below the welding timer.

Welding timer standard on a UN35 butt welder:

1) Six stage Vertical mount
2) 7 selectable programs
3) Solid state membrane facia

(3) Rear of the machine

There are two hinged doors in the rear of the machine that give access to the firing board and the thyristor unit. The main supply point for electrical power is located behind these doors. Access to the rear of the clamping cylinders located on the top of the machine. The FRL (filter/lubricator/regulator) can be seen on top of the machine.

(4) Left hand side of the machine

There is only a blank panel on this side of the machine.

(5) Looking at the top of the machine

Moving to the front of the machine we now look at the top of the machine where we find:

1) Clamping jaws on the left.
2) Upset cylinder on the right side.
3) The 1/4" 5/2 24vdc body port two solenoid valves at the rear of the machine.
4) The FRL (filter/regulator/lubricator) back right hand side.

General Note on machine weights and sizes are for guideline purposes only; due to machine improvement and client specific requirement Westken reserves the right to change machine size / mass specifications without notice.

3) UN35	Approximately 200kg	800 wide x 800 deep x 950 high

CHAPTER TWO:

*Installation of a **"UN35**" air operated Butt welding machine.*
(UN35 Butt welder)

1) *Bolting the machine down.*
2) *Cable sizes and fusing.*
3) *Water pipes*
4) *Machine Fusing with supply cable not exceeding 10m*

Please Note: Installation must only be undertaken by a' **"Qualified electrician"**

The installation of this type of machine is undertaken as follows. The electricity supply is connected inside the machine to the isolator switch or connection board only. The power is fed from the client's distribution board where additional isolation should be present. This will ensure safety during installation and maintenance. The connection, to the switch or connection board, is made using two lugs and secured to the switch by means of a screw or nut and bolt. Connection of phasing is not critical. The phase requirement of the machine should be checked before installation.

This machine is two-phase equipment and uses two of the three phases. Do not use the third phase as the earth. This can kill. Ensure that the earth is connected securely to the earth mounting point on the right-hand side of the machine.

1) Locate machine in position and bolt down using the holes provided in the base plate.
2) Connect electrical power supply to the on/off switch or connection board provided within the machine, see voltages, cable sizes and supply fusing below. When using a 380volt machine it is important to note the machine uses two phases of the three-phase supply. It is critically important that the machine is properly earthed to the earth stud provided on the machine.
3) Connect a minimum 10/12mm water supply/return pipe to the inlet/outlet connection on the machine. The water supply must be a 3bar supply with a return back pressure not exceeding 1,5bar or 50% of the supply pressure.
4) Switch on water and inspect for leaks.
5) Connect air supply to air inlet position on the lower right-hand side. A supply of 4 to 7 bars is suggested. The pressure to the clamps and upset cylinders is through a pressure FRL unit and can be adjusted.
6) Switch on electrical supply.
7) Adjust timer settings to minimum time and weld heat/current setting and undertake a test weld.
8) Adjust machine to suit application.

General Note on machine cable sizes and fusing; due to machine improvement, client specific requirements ***Westken*** reserves the right to change machine specifications without notice. These cable sizes are calculated on a max supply cable length of 10m. Longer cable lengths will be a higher mm^2 due to volt drop.

1) UN35 Approximately 60amps cable size 16mm^2 supply

CHAPTER THREE:

*Operational system of a **"UN35**" air operated Butt welding machine.*
(UN35 Butt welder).
Please read this in conjunction with section on "spotwelding" on our website.

1) The operator locates the material to be welded within the correct size "V" grooves in the lower electrodes and brings the two faces of the part to be welded together.. Once located in position the operator presses down on the foot switch.
   Keep fingers out of the electrodes clamp area.
2) The downward movement of the foot switch triggers the ***electric micro switch*** in the ***footswitch*** and initiates the welding controller.
3) The two electrodes clamp simultaneously onto the parts. The upset cylinder applies pressure and initiates the welding timer
4) The timer then switches the ***thyristor (semipak)*** to allow electrical supply into the ***welding transformer*** for a specified time.
5) When electricity is fed into the ***welding transformer*** it is converted (transformed) from high voltage/low amperage (380v/60amps) into low voltage/high amperage (10volts/10000amps). This ***transformed electrical supply*** is directed from the transformer, through the machine electrodes butt welding area.
6) Due to a higher ***resistance*** to electricity in the steel parts to be welded than in the copper electrodes heat is formed in the weld area causing the metal to melt, the molten or ***wet metal*** is held together by the electrode clamps and the ***follow-up pressure*** from the upset air cylinder applies additional pressure on the weld.
7) Once the hot red color in the weld area disappears from between the welding tips the ***timer*** will then allow the welding tips/electrodes to open and the completed welded part can be removed.

Basic startup setting of a UN35 timer system on an air spot welder.

Please read the following on our website,
Introduction to setting of Westken timer systems.

Welding timers & water-cooled Thyristors standard on air operated spot welders are:

1) *UN35* *7 program vertical* *160amp Semipack thyristor*

The suggested setup of the UN35 timer controller system

1. Press green run/set button. Then one of the windows will start to flash.
2. Press right hand arrow to move to the next window. At this point you will be able to adjust units. To adjust tens then utilize the left-hand arrow.
3. Use the "plus" or "minus" buttons to increase or decrease the flash window.
4. Once completed press the right-hand arrow to access the next window.

Please note* that under normal setting procedures you will only need adjustment on the time "1" and heat"1"

5. Once programming has been completed then press run/set to return the timer controller to run condition.

There are three switches on the lower facia that allow:

- 1st switch clamps the part.
- 2nd switch upsets the part without welding.
- 3rd switch is for timer only and does not isolate the machine.

Basic setting and set up:

1) The timer allows for the selection of 7 individual programs depending on the setup of the controller.
2) Squeeze time; keep this time setting short between 2 and 6 cycles.
3) Upslope; 1 to 3 cycles to minimize sparking during welding.
4) Weld one; allow sufficient welding to achieve a cosmetically good weld without excessive expulsion of weld area.
Please note* weld time must always be longer that the upslope time.
5) Heat one; this adjusts the percentage of weld heat going into the weld area as a percentage of the total machine output. Too much heat and the part will disintegrate during welding, to little will cause a cold weld and the joint will not fuse properly and will break.
6) All other setting set to "0" zero. Only hold is set to 5 to allow the weld to dry in the weld area.

GENERAL DISCLAIMERS:

West Kennett Corporation is not liable for damages resulting from, or attributable to the non-compliance of the user of the procedures and recommendations in this manual. Failure to observe these instructions may cause serious injury or death and may result in the warranty being declared null and void.
Read and understand the entire contents of this user manual, with special emphasis on the safety instructions and procedures throughout the user manual, before installing, operating, or maintaining this equipment. This machine and user manual is for use only by persons trained and experienced in the safe operation of welding equipment. Do not allow unqualified persons to install, operate, or maintain this machine. Contact your distributor if you do not fully understand this user manual. Wear safety clothing and always use safety equipment.

If you are not sure, please phone and ask, we will help.

West Kennett Corporation retains the right to modify, improve, and upgrade our products at any time without prior notice due to ongoing improvements of our products and services.

And finally,

This is another in a set of documents that hopefully will help you understand the equipment better. There will be a more in-depth study of the timer, air system, cooling system and how and why a weld takes place.
Look on our website ***www.westken.co.za*** for the following:

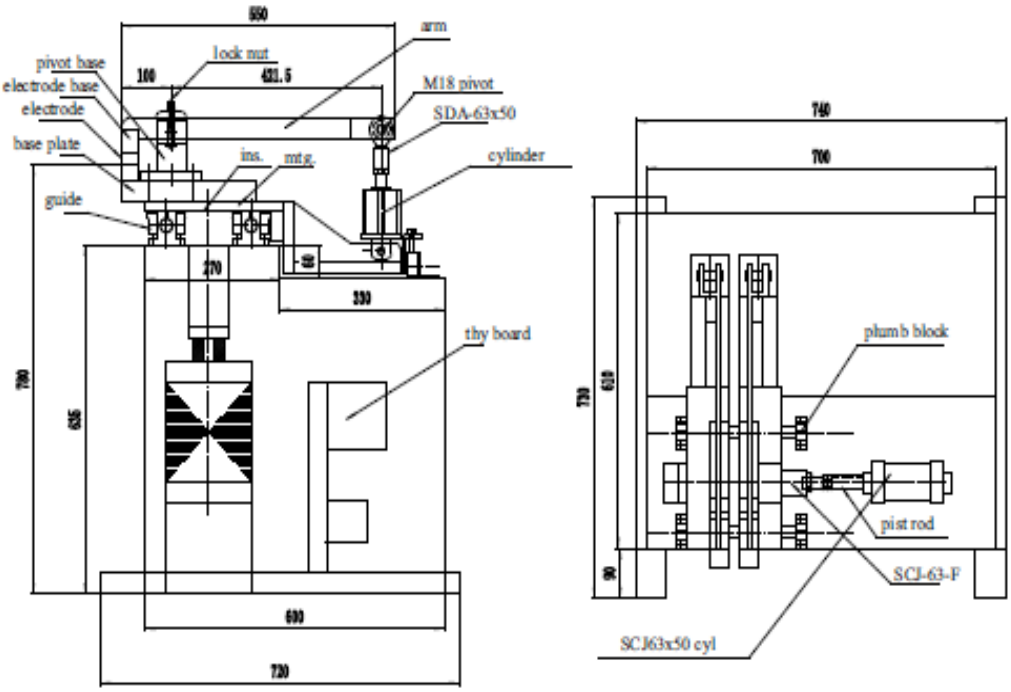
1) Introduction to set-up of Westken spotwelding timers for newcomers & others.
2) Cooling water for welding machines.
3) Explanation of clever words & terms concerning Resistance welding & timer systems.
4) Introduction to Spotwelding for newcomers and others.
5) Introduction & a basic explanation to Timer control systems.
6) Manuals for other machines in our range of equipment.

If you have any questions concerning the above or others question concerning resistance welding, please do not hesitate to contact one of our really clever people at ***Westken***. Try the following people who might be able to give a helping hand or some good advice. Remember they do it almost every day, I am talking resistance welding.

Really technical stuff concerning the mechanical and electrical layout and workings of the machines:
…….. Mr. Stuart Dorling. ***tech@westken.co.za***

Stuff concerned with machining the copper, brass, soldered type electrodes etc and the setup and usage of Brickforce machinery.
…….. Mr. Jaco Truter. ***info@westken.co.za***

When you can get stuff and how much stuff costs
…… Mr. Altus Van Der Walt. ***sales@westken.co.za***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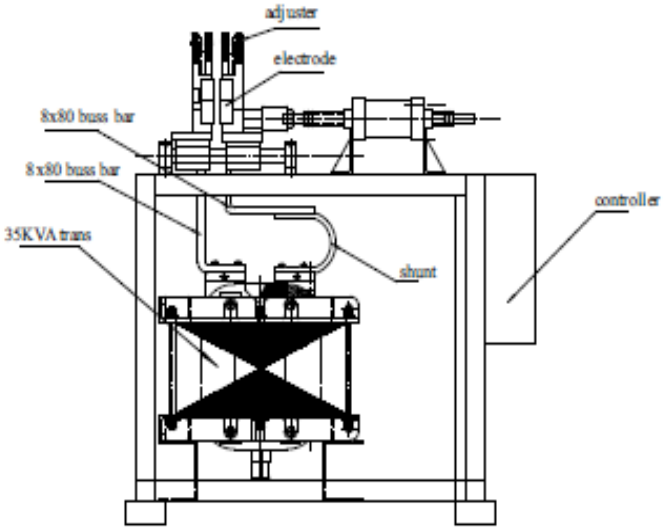
adjuster
electrode
8x80 buss bar
8x80 buss bar
35KVA trans
shunt
controller

35KVA
UN 35

UN 35Butt Welder, Wiring Layout:

	3	380 V in		
	1	380 V in		
	13			
	12	AV2		
	11	AV1		
	10	AV Com		
	8	G1		
PCB	5	K1		
	7	G2		
	4	K2		
	61			
	60			
	42			
	41			
	40	Thermo	_____	
	20	Gnd com	_____	Thermo
	24	Bit 8		
	23	Bit 4		
	22	Bit 2		
	21	Bit 1	_____	
	20	Gnd com	_____	Foot Sw