INSTRUCTIONS AND PARTS MANUAL

BGW-5000
BGW-6000
GIRTH WELDERS

Please record your equipment identification information below for future reference. This information can be found on your machine nameplate.

Model Number: _____

Serial Number: _____

Date of Purchase: _____

Whenever you request replacement parts or information on this equipment, always supply the information you have recorded above.

LIT-BGW-5000-6000-IPM-0415

Bug-O Systems is guided by honesty, integrity and ethics in service to our customers and in all we do.

BUG-O SYSTEMS
A DIVISION OF WELD TOOLING CORPORATION

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SAFETY

PROTECT YOURSELF AND OTHERS FROM SERIOUS INJURY OR DEATH. KEEP CHILDREN AWAY. BE SURE THAT ALL INSTALLATION, OPERATION, MAINTENANCE AND REPAIR PROCEDURES ARE PERFORMED ONLY BY QUALIFIED INDIVIDUALS.

ELECTRIC SHOCK can kill.

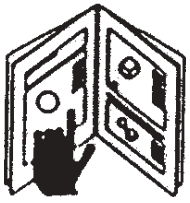
1) The equipment is not waterproof. Using the unit in a wet environment may result in serious injury. Do not touch equipment when wet or standing in a wet location.

2) The unused connectors have power on them. Always keep the unused connectors covered with the supplied protective panels. Operation of the machine without the protective panels may result in injury.

3) Never open the equipment without first unplugging the power cord or serious injury may result.

4) Verify the customer-supplied power connections are made in accordance with all applicable local and national electrical safety codes. If none exist, use International Electric Code (IEC) 950.

5) Never remove or bypass the equipment power cord ground. Verify the equipment is grounded in accordance with all applicable local and national electrical safety codes. If none exist, use International Electric Code (IEC) 950.



READ INSTRUCTIONS.

Read the instruction manual before installing and using the equipment.

EQUIPMENT DAMAGE POSSIBLE.

1) Do not plug in the power cord without first verifying the equipment is OFF and the cord input voltage is the same as required by the machine or serious damage may result.

2) Always verity both the pinion and wheels are fully engaged before applying power or equipment damage may occur.

3) Do not leave the equipment unattended.

4) Remove from the worksite and store in a safe location when not in use.

FALLING EQUIPMENT can cause serious personal injury and equipment damage.

Faulty or careless user installation is possible. As a result, never stand or walk underneath equipment.

MOVING PARTS can cause serious injury.

1) Never try to stop the pinion from moving except by removing power or by using the STOP control.

2) Do not remove any protective panels, covers or guards and operate equipment.

HIGH FREQUENCY WARNINGS

SPECIAL PRECAUTIONS ARE REQUIRED WHEN USING PLASMA, TIG OR ANY WELDING PROCESS THAT USES HIGH FREQUENCY TO STRIKE AN ARC.

WARNING: HIGH FREQUENCY CAN EFFECT MACHINE OPERATION AND THEREFORE, WELD QUALITY.

Read the precautions below before installing and using the equipment.

PRECAUTIONS:

1) Some plasma or welding cables are strong sources of high frequency interference. NEVER lay a plasma or welding cable across the controls of the machine.

2) Always physically separate the plasma or welding cable leads from the machine cables. For example, the plasma or welding cable leads should NEVER be bundled with a pendant cable or the machine power cord. Maximize the separation between any machine cables and the plasma or welding cables.

3) Strictly follow the grounding procedures specified for the plasma or welding unit. NOTE: Some plasma and welding units produce exceptionally large amounts of high frequency noise. They may require a grounding rod be driven into the earth within six feet (2 meters) of the plasma or welding unit to become compatible with an automatic cutting or welding process.

4) If the high frequency is produced using a spark gap, adjust the points so the gap is as small as possible. The larger the gap, the higher the voltage and the higher the interference.

5) Some plasma or welding units will inject high frequency interference into the AC power line. Use separate power line branches whenever possible to power the plasma or welding source and the machine. Do not plug them into the same outlet box.

6) High frequency noise may enter the machine through the plasma or welding supply remote contactor leads. Some plasma and welding sources can produce noise spikes of up to several thousand volts. These sources are not compatible with automated cutting and welding equipment. It is recommended that the remote contactor leads on these plasma or welding sources not be connected to the machine. An alternate solution is to purchase a separate remote contactor isolation box.

SAFETY INSTRUCTION

BUG-O / ALL-TIME arc welding and cutting equipment is designed and built with safety in mind. However, correct installation and operation are the most important measures to ensure your safety. Installation, operation and maintenances before reading through this manual and corresponding safety regulations included in this is manual is strongly recommended. Most importantly, customers should consider proper installation, and maintenance before operation.

1. Beware of electric shock

A. During the welding operation of the Equipment, the circuit formed between the covered electrode and the work piece (or the ground) is charged. Exposed skin or wet or damp clothing may cause harm if you make contact with these charged parts. Workers should put on dry gloves with segregated fingers to obtain good insulation.

B. Use dry and insulated protection to insure that you are insulated from the work-piece and the ground. Moreover, the insulation should be enough to isolate you from the work piece or the ground. If the welding operation must be conducted in the circumstance that may cause electric shocks (in moist places or wearing wet or damp clothes; on the metal structure such as the floor, the palisade and the scaffold; when the body is not stretching such as sitting, kneeling or reclining, and the body will inevitably have contact with the work piece or the ground in these condition), the operation should be conducted according to the security specification and the following equipment should be utilized:

- Semi-automatic DC constant-voltage (wire feeding machine) welder
- DC manual metal arc welder
- AC welder with anti-electric function

C. In the semi-automatic and automatic welding process, many parts are charged, such as the wire, the wire-feeding wheel, the welding head, the nozzle and the semi-automatic welding torch.

D. Ensure that the electric cable is firmly connected with the work piece metal. Moreover, the connection should be as close as possible to the welding zone.

E. The work piece to be welded should be grounded well.

F. Ensure that the electrode holder, the work piece gripper and the welder are operated in good conditions. Damaged insulation parts should be replaced.

G. Immersion of the electrode into the water to cool is forbidden.

H. Touching two wire holders of different welders simultaneously is forbidden for the reason that the voltage between them may be the sum of their open circuit voltages.

I. In the course of suspension work, the worker should use safety equipment to avoid falling.

2. Beware of the arc light

A. When you observe the arc light during the welding process, you should wear a mask with welding -rated glass. Appropriate flame-retardant material should be used to protect other persons and warn them not to observe the welding arc light or to keep away from the arc light, the spatter or hot work piece.

B. The mask with black glass and cover plate is to protect your eyes from burning by the spark or arc light. The mask and black glass must meet the requirements listed in the standard ANSIZ87.1. Wear clothes made of refractory materials to protect skin from burning by the spark or the arc light.

3. Beware of the welding fumes

A. The exhausted gas during the welding process is harmful to our health, thus we should avoid inhaling these gases. When we conduct the welding operation, the head should avoid facing the welding fume and the exhausted gas. It is necessary to install enough ventilation equipment to keep these gases away from the breathing zone. In the welding process of stainless steels, or layer rich in cadmium (refer to corresponding items on containers and MSDS), or steels containing lead and plated with cadmium with the manual metal arc welding, some poisonous gas and fume will be generated, and then specific ventilation equipment is needed. In these conditions, try to reduce the direct exposure and local gas exhaustion or mechanical ventilation equipment should be applied when it is lower than the lowest value. In the restricted zones or outdoors, protection masks are needed. Also take protection measures in the course of welding galvanized steels.

B. Welding operations are forbidden near the steam of chloridized hydrocarbons generated in the course of the lubrication, cleanliness or spraying operations. The arc heat and arc light will react with these chloridized hydrocarbons to generate gaseous phosgene and stimulus with virulent property.

C. The shielding gas used for the welding technology is harmful to our body and even can lead to death. It is necessary to install enough ventilation equipment to ensure the breathing safety, especially in a narrow working space.

D. Read through and understand the supplied manuals for the equipment and consumables, including the material safety databases (MSDS). Be sure to comply with the employer's safety regulations as well. The MSDS can be obtained from distributors or the manufacturers.

4. Fire prevention

A. Keep combustibles away from the welding area. If this isn't possible, they should be covered in the chance there is a fire caused by the welding spatter. Keep in mind that welding spatters and hot material can easily flow though the slit in the welding area and then lead to a fire hazard. In addition, welding operation near a pipeline for the fuel gas should be forbidden and fire-fighting equipment should be instantly accessible.

B. When compressed gas is needed in the work site, specific measures must be taken to avoid the occurrence of execrable incidences. Corresponding items can be referred to the "Welding and Cutting Safety" (ANSI standard A49.1) and the operation instructions.

C. When the welding equipment is not being used, be sure that the electrode circuit does not contact with the work piece or the ground. A sudden contact may lead to overheating and the possibility of a fire.

D. When proper measures are not taken combustible or poisonous gas may be generated. The heating, cutting or welding of an oil tank, barrel or other vessels are all forbidden. An explosion may occur even when it is cleaned. You can purchase the "Safe Practices for the Preparation of Containers and Piping for Welding and Cutting" from the American Welding Society (AWS) and the code is AWSF4.1.

E. Make sure that the empty casters or vessels are exhausted totally before the heating, cutting or welding operation. Otherwise, there is a possibility to result in a explosion.

F. There are sparks and spatters when welding. The welding worker must put on the oil-free protection clothes, such as fur-lined gloves, dark shirt, trapped pants, high-top shoes and cap. When the welding operation is conducted at abnormal positions or narrow places, wearing earplugs is also necessary. In narrow areas, eye protection with lateral shade is also needed.

G. During the welding process, the connection between the work (ground) cable and the work piece should be as close as possible. When the work (ground) cable is connected with the building structure or other places away from the welding area, it is liable to make the welding current flow through the lifting chain, the lifting rope or some other stand-by circuit and this can lead to fire or the overheating of the lifting chain until it fails.

5. Cylinder has a danger of explosion

A. Only gas cylinders containing accurate compressed shielding gas for welding can be used, and the regulation of the gas pressure must be conducted correctly. Moreover, all used hoses and accessories must meet the application requirements and be in good condition.

B. Utilize a tripod or a fixed support to fasten the gas cylinder and keep it in the vertical position. The gas cylinder should located at:

   a) A place that will prevent physical damage.
   b) A place away at a safe distance from the welding or cutting operation, a gaseous heat resource or fire and spatters.

C. The contact of the covered electrode, the electrode holder of some other charged objects to the gas cylinder is forbidden.

D. Worker's head and face should not face the outlet of gas valves when they are screwed open.

E. The valve protection should be kept installed and be screwed tightly unless it is being used.

F. You can obtain the P-1 "Safe Handling of Compressed Gas in Containers" published by CGA from the compressed gas organization-----Jefferson Daves Highway, Arlington, VA22202. Read through and understand the items on compressed gas cylinders and corresponding equipment.

6. Notes for electrical operations

A. Utilize the main switch on the fuse box to cut off the input power source before servicing this equipment.

B. Install the equipment according to the national electrical requirements, local laws and regulations and the suggestions from the manufacturer.

C. The equipment should be grounded according to the national electrical requirements and the suggestions from the manufacturer.

7. Equipment that is classified as internal combustion engines

A. The engine should be shut down before the troubleshooting and maintenances unless it needs to run during the maintenances.

B. The engine should be operated in an open place with good ventilation conditions, or else the waste gas must be exhausted outdoor.

C. Refueling is forbidden near the welding arc or when the engine is running. The engine should be stopped and not refueled until it cools down, avoiding spilling fuel and contact to the hot parts of the engine as it may cause a fire. If fuel spills out, then the engine can be started only when the spill is wiped clean.

D. Keep the safety covers and devices at appropriate places and maintenance should be conducted on time. During the starting, operation and maintenance of the equipment, hair, clothes and tools should be kept away from V-belts, gears, fans and other moving parts.

E. Sometimes, the protection cover must be disassembled to facilitate the maintenance. Keep in mind that the protection cover can be disassembled if it is necessary and it should be replaced quickly after the maintenance. In addition, it is necessary to be cautious when you work near moving parts.

F. Hands are forbidden to be near the fan. When the engine is running, it is forbidden to push the control lever of the gas throttle forcibly regardless of the speed governor or the idler wheel.

G. When the engine or the welding power source is rotated during maintenance, connections of the sparkplug, the ignition distributor, the electromagnetic generator and others must be disconnected to prevent the accidental starting of the gasoline engine.

H. To avoid scalds, the radiator cap is prohibited to be opened when the engine is still hot.

8. Electromagnetic fields are harmful to human bodies

A. The current flowing through any conductors will generate an electromagnetic field (EMF), thus welding current will generate an EMF near the welding cable and the welder.

B. Cardiac pacemaker can be affected by an EMF, thus welding workers who have cardiac pacemaker must consult doctors before the welding operation.

C. When exposed in the EMF during the welding operation, it may results in some other unknown effects to the human body.

D. All welding worker must follow the following measures to reduce the exposure extent of the EMF area in the welding circuit.

1. Coil the covered electrode and the working cable together and fasten them with rubberized fabric if it is possible.

2. The coiling of the welding cable around body is prohibited.

3. The operator is prohibited to be located between the covered electrode and the working cable. That is to say, the working cable should be located on your right if the covered electrode cable is on your right.

4. The work (ground) cable should be as close to the work piece as possible.

5. Work in the vicinity of the power source is prohibited when the unit is being used.

BGW-5000/BGW-6000 GIRTH WELDERS

INSTRUCTIONS AND PARTS MANUAL

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I. GENERAL DESCRIPTION

The (BGW) Automatic Girth Welder is a self-propelled machine for horizontal girth (3 o'clock) welding of large storage tanks having 6' – 10.5' (1.8 – 3.2m) high plate courses.

The unit is supported by the shell plates to be welded. The machine has its own welding head, controls, flux belt assembly and flux recovery unit.

The standard welding equipment integrated into the unit is the Lincoln Electric USA submerged arc welding system. Please consult factory for integration with other welding equipment (e.g. ESAB, Miller).

1.1. Single and Double Sided Welding

With variations in designs; the Automatic Girth Welder can perform single sided (BGW-5000) or double sided (BGW-6000) operations.

BGW-5000

The single sided unit, BGW-5000 is the most commonly used unit due to its light weight and simplicity. It requires only one operator.

BGW-6000

Designed with the same principle as BGW-5000, but with an "A" frame that carries one set of weld heads on each side of the tank.

One side, referred to as the master, can be used by itself for one sided welding. The second side (slave) is hinged to the top of the master frame and is used when welding two sides.

The operator can move freely from one side of the machine to another by climbing up the ladder on one side to the common roof of the double sided machine. Two operators are required for normal operation.

A safety rail is provided at the roof of the main frame for safety purpose.

The BGW-6000 requires two welding power supplies. Each unit has a flux recovery unit and controls.

1.2. Welding Process

The BGW-5000 is normally equipped for single wire submerged arc welding.

Typical weld procedure calls for a welding travel speed of around 18 in/min (450mm/min), 400A, 28-30V and WFS of 91" (2300 mm). Single torch deposition rate is approximately 11 lbs/hr. (5kg/hr.)

BUG-O systems is not responsible for any welding parameters or guidelines for the BGW machines and or the SAW process.

Please have all parameters for SAW provided prior to the beginning of setup of machines.

We do offer a starting guide for parameters in our instruction manual, this is just a guide and not an exact set of parameters to be followed.

II. TECHNICAL SPECIFICATIONS

1. Input voltage:	3 phase, 220V/380V/460V V±10% (Standard) * Consult factory for non-standard power input
2. Input frequency:	50Hz±5% / 60Hz±5%
3. Operation temperature:	-10°C----+50°C; Relative humidity: >90%; 14 degrees F -122 degrees F
4. Environmental protection:	IP23 grade: F
5. Tank diameter operation range:	>15' (4.5 M)
6. Operation tank shell plate width: [Standard]	for Bottom to Top: 6'-10.5' (1.8-3.2m) for Top to Bottom: 6'-8.7' (1.8-2.6m)
7. Max Load Capability:	250kg (551.16 lbs.)
8. Travel Speed:	100-2900 mm/min (3.94-114 in/min.)

* Models and specifications subject to change without notice.

III. KEY COMPONENTS

3.1 Main Frame

The Main frame of the girth welder is constructed of structural steel and square tube members. The sliding square tube mechanism with locking pins and pin holes is used to adjust the frame height for welding different sizes of shell plates. The main frame of the girth welder is designed to support 550 lbs (250 kg) of weight, or enough for two operators.

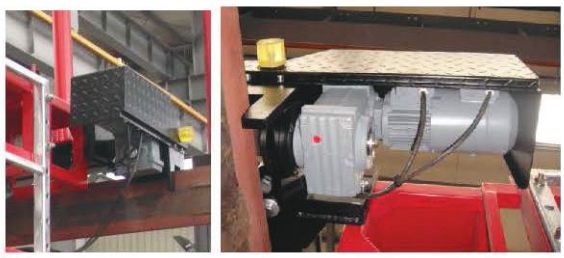
The frame contains two serrated hardened steel flanged drive wheels manually adjusted to ride tank diameters down to a minimum of 15' (4.5 m.) The distance between wheel flanges is 1.8" (45mm) [standard] to accommodate the shell wall thickness.

The machine frame is equipped with a hand railed operator platform with seat; a ladder provides a means for operator to climb to the roof and access to the electric flux winch and separator tank for flux refill.

Guide wheel assembly at the lower end of the frame also helps to simplify loading and unloading the machine on to the tank. Canvas curtains offer arc and operator protection in windy conditions.

3.2 Dual Motor Drive

Each single, flanged drive wheel is driven by an individual motor / reducer to provide extra tracking force to prevent slipping that could cause weld defects. Drive motors are enclosed inside the frame top section with aluminum panels for good weather protection.



Speeds for both motors are electronically synchronized and governed by a Mitsubishi or ABB inverter for accurate speed travel.

AC inverter:

1. Single-phase 220VAC input voltage
2. Automatic lift in torsion, 150% lift torsion in 6Hz.
3. Fully programmed & calibrated in factory
4. Soft PWM, running in low noise
5. 15 speed, PID, 4-20 MA input
6. Provides RS-485 communication

Caution: All inverter drives inside the GIRTH WELDER control are pre-programmed before the Girth welder is delivered to users on site, please consult factory if re-programming is required.

The SEW motors and reducer require minimal maintenance with advantages of low noise & vibration, with 96% high efficiency through the reducer. It consists of a high rigid housing and spur gear; all parts are precisely machined with minimum tolerance for accurate travel mechanism.

3.3 Welding Gear

The standard welding equipment supplied is the Lincoln's NA-3S/MAXsa 29 wire feed head and weld head fitted with nozzle, wire feed rolls, wire straightener, and 50lbs (23Kg) wire reels for feeding up to 3.2 mm (1/8") diameter wire.

Lincoln USA DC600 /DC1000/ACDC1000SD is the standard power supply for the girth welder. Standard input power is 380V/3ph/50Hz and the line power requirement is 40kVA. Other voltages and frequencies are available, please consult factory for details.

Please refer to Lincoln's NA-3S/MAXsa 29 DC600 /DC1000/ACDC1000SD Instruction manuals for more information on their welding equipment.

Power supplies are installed on a steel storage case with the electrical cabinet for weather protection.

3.4 Weld Head Assembly

The BGW weld head is mounted on a manual cross slide system, which allows the operator complete control of wire placement and joint tracking.

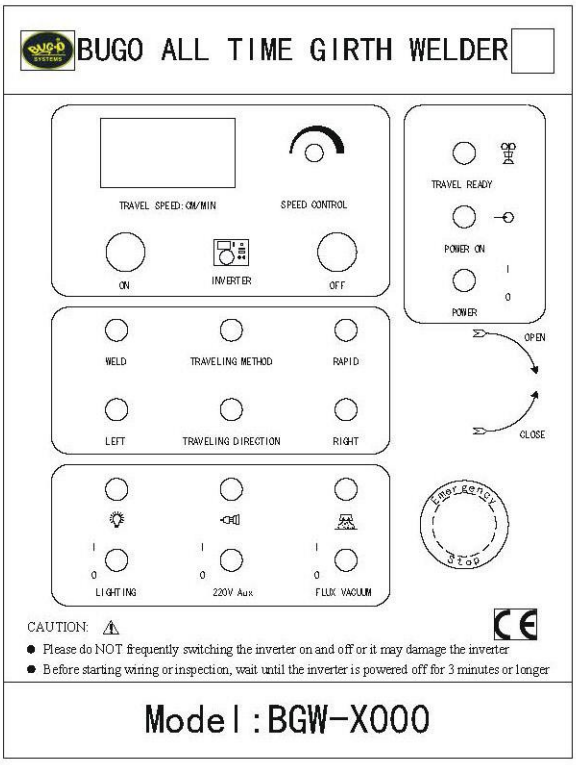
Due to the lack of visibility of the submerged arc welding process, a laser pointer is mounted on the nozzle to provide a position reference for operator while welding.

3.5 Control

3.5.1 Welding control

Lincoln NA-3S/ MAXsa10 welding control is the standard control supplied with the Girth welder. It is mounted at the right hand side of the main frame for operator easy access, directly on top of the welding control is the girth welder master control.

3.5.2 Master control



The Girth welder master control houses the electronic travel inverter drive and associated control relays; it provides a means of integrated control of all the accessories of the Girth welder(e.g. flux vacuum, 220V single phase aux outlet, lamp, flux winch).

The control panel includes all necessary control knobs and switches such as the speed control potentiometer, direction switch, full speed travel switch as well as emergency stop button.

“Power source switch”
Turns on main power of the control

“Left-Stop-Right” travel direction switch (SA3)
Placing the switch in the selected side causes the machine to move in that particular welding direction.

For automatic travel, the travel switch on the NA3 must be in the travel position. To operate manually, the switch must be in hand position.

“Speed potentiometer” (SA2)
Accurately adjust travel speeds (cm/min) of
the Girth welder. The speed can be monitored at the control display.

★US version AGWI-DU would be programmed to display travel speed in IPM (inch per minute)

Normal / full speed travel switch
Activate Girth welder full speed travel when the weld gear is set to “manual” mode or “off”.

“Flux recovery vacuum” switch (SA4)
Turns on power of the vacuum for flux recovery

Inverter ON/OFF

Push buttons switch to power on / off the inverter.

> **CAUTION:** Switching the inverter on and off in short interval could cause damage to the inverter. It is recommended to not switch on the inverter again for at least 3 minutes after is it turned off

⚠ **“Lighting switch”**

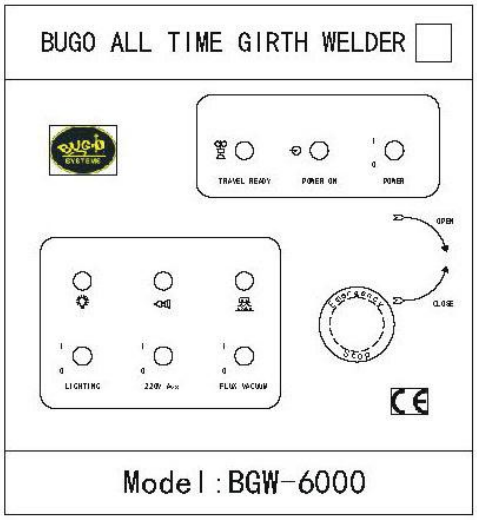
Switch on the hurricane lamp for night operation.

Emergency stop

Push button stops all electronic functions including welding and travel.

3.5.3 Slave Control (for BGW double sided model only)

Used at the slave side of the double sided girth welder, it is basically the same as the master control but without the function to control the drive system.



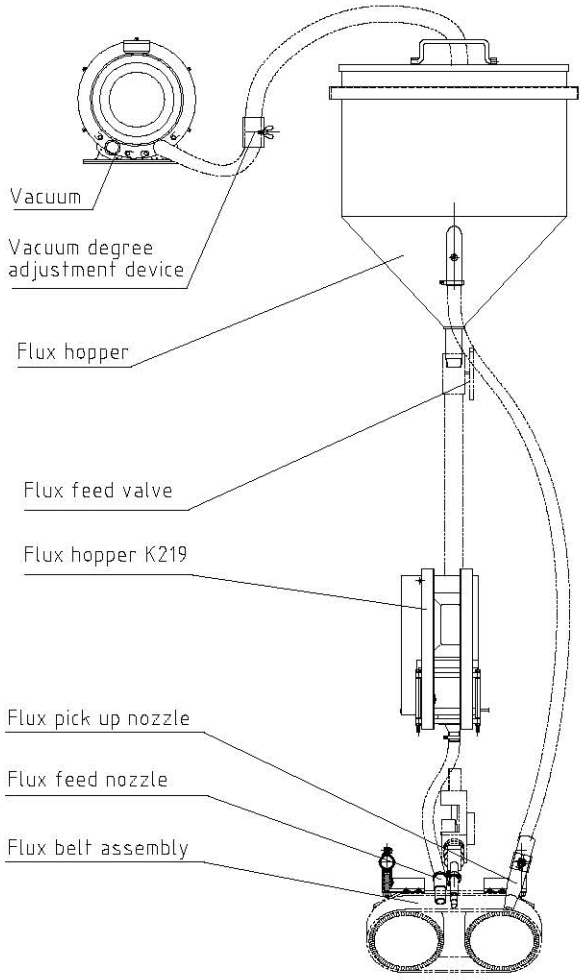
3.6 Flux Recovery

3.6.1 Flux recovery unit

The welding head assembly includes a flux belt mechanism for necessary flux recycling.

The flux belt is made of heat resistant latex belt that can tolerate temperatures up to 250 degree C (480 F). The belt is mounted on two 150mm (5.9") diameter rollers, which can be adjusted and positioned by the flux belt assembly hand wheel.

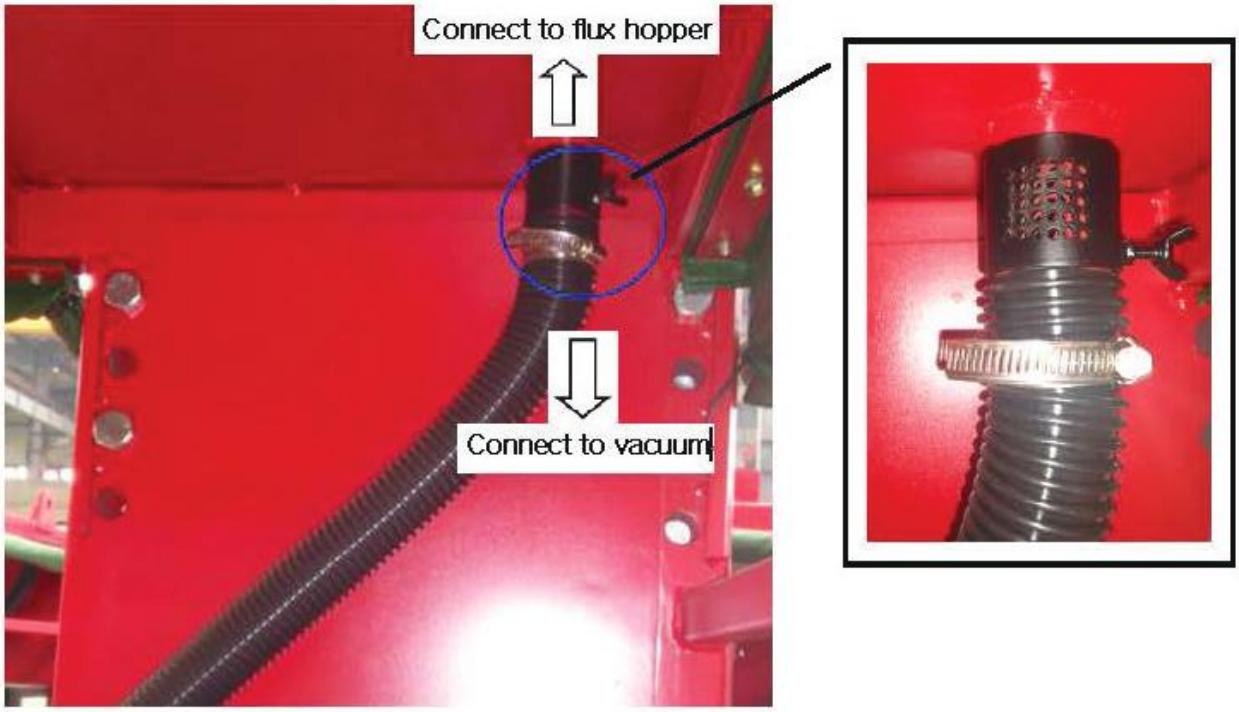
The welding flux falls on the flux belt, is extracted by the suction hose and returned to the flux hopper (80kg (176lbs) capacity) mounted on the platform.



The Girth welder is equipped with a heavy duty blower type vacuum for multi shift continuous operation. Such vacuum systems can be configured as follows to suit various operation requirements:

(a) Separator / Filter mounted on top of the operator platform.
(b) Separator / Filter mounted on frame roof (vacuum system would move upward along with the roof and drive section of the welding cabin)

3.6.2 Vacuum degree adjustment device



Undo the butterfly bolt, and turn the outside sleeve to adjust the vacuum degree in the flux hopper

3.7 Electrical Cabinet & Power Source Storage

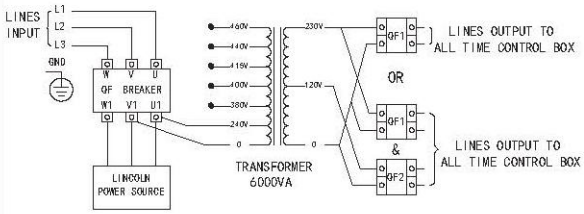
The electrical cabinet of the Girth welder is inside the power source storage, it consists of a main circuit breaker at the left to receive the local 3 phase input (380V / 3ph/ 60Hz as standard) and distribute it to the power supply and the step down transformer, which in turn steps down the voltage to 220VAC single phase to the secondary circuit breaker.

Single phase 220VAC is required by the master control and all electrical accessories supported by the Girth welder.

⚠ WARNING HIGH VOLTAGE CAN KILL

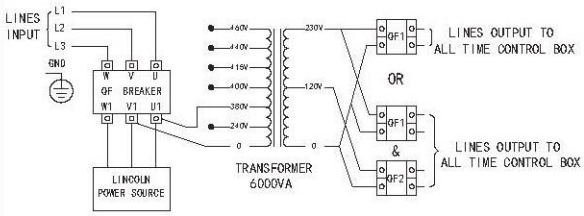
- Do not operate with covers removed
- Disconnect input power before servicing
- Do not touch electrically live parts
- Only qualified persons should install, use or service this equipment

240V/380V/400V/415V/440V/460V INPUT SUPPLY CONNECTION DIAGRAM



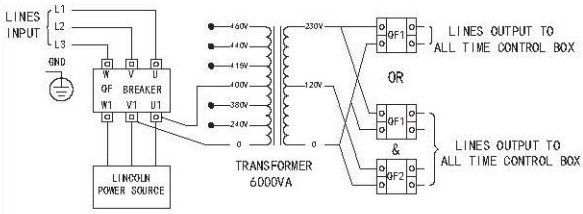
CONNECTION FOR 240 VOLTS, 50 OR 60 HZ

1. CONNECT L1, L2 & L3 INPUT SUPPLY LINES LEADS TO THE INPUT SIDE OF QF BREAKER AS SHOWN.
2. CONNECT TERMINAL MARKED ⏚ TO SYSTEM GROUND PER NATIONAL ELECTRIC CODES.
3. CONECT U1, V1 & W1 OUTPUT LINES TO THE LINCOLN POWER SOURCE.
4. CONNECT TRANSFORMER LEADS 0, 240V TO U1, V1.



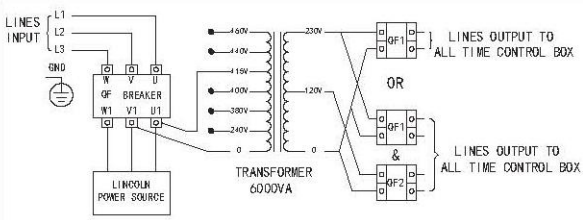
CONNECTION FOR 380 VOLTS, 50 OR 60 HZ

1. CONNECT L1, L2 & L3 INPUT SUPPLY LINES LEADS TO THE INPUT SIDE OF QF BREAKER AS SHOWN.
2. CONNECT TERMINAL MARKED ⏚ TO SYSTEM GROUND PER NATIONAL ELECTRIC CODES.
3. CONECT U1, V1 & W1 OUTPUT LINES TO THE LINCOLN POWER SOURCE.
4. CONNECT TRANSFORMER LEADS 0, 380V TO U1, V1.



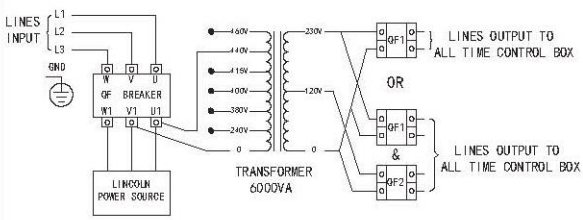
CONNECTION FOR 400 VOLTS, 50 OR 60 HZ

1. CONNECT L1, L2 & L3 INPUT SUPPLY LINES LEADS TO THE INPUT SIDE OF QF BREAKER AS SHOWN.
2. CONNECT TERMINAL MARKED ⏚ TO SYSTEM GROUND PER NATIONAL ELECTRIC CODES.
3. CONECT U1, V1 & W1 OUTPUT LINES TO THE LINCOLN POWER SOURCE.
4. CONNECT TRANSFORMER LEADS 0, 400V TO U1, V1.



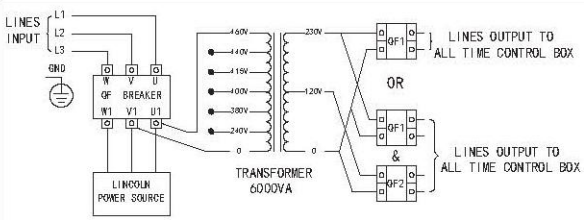
CONNECTION FOR 415 VOLTS, 50 OR 60 HZ

1. CONNECT L1, L2 & L3 INPUT SUPPLY LINES LEADS TO THE INPUT SIDE OF QF BREAKER AS SHOWN.
2. CONNECT TERMINAL MARKED ⏚ TO SYSTEM GROUND PER NATIONAL ELECTRIC CODES.
3. CONECT U1, V1 & W1 OUTPUT LINES TO THE LINCOLN POWER SOURCE.
4. CONNECT TRANSFORMER LEADS 0, 415V TO U1, V1.



CONNECTION FOR 440 VOLTS, 50 OR 60 HZ

1. CONNECT L1, L2 & L3 INPUT SUPPLY LINES LEADS TO THE INPUT SIDE OF QF BREAKER AS SHOWN.
2. CONNECT TERMINAL MARKED ⏚ TO SYSTEM GROUND PER NATIONAL ELECTRIC CODES.
3. CONECT U1, V1 & W1 OUTPUT LINES TO THE LINCOLN POWER SOURCE.
4. CONNECT TRANSFORMER LEADS 0, 440V TO U1, V1.



CONNECTION FOR 460 VOLTS, 50 OR 60 HZ

1. CONNECT L1, L2 & L3 INPUT SUPPLY LINES LEADS TO THE INPUT SIDE OF QF BREAKER AS SHOWN.
2. CONNECT TERMINAL MARKED ⏚ TO SYSTEM GROUND PER NATIONAL ELECTRIC CODES.
3. CONECT U1, V1 & W1 OUTPUT LINES TO THE LINCOLN POWER SOURCE.
4. CONNECT TRANSFORMER LEADS 0, 460V TO U1, V1.

Attention: Please check whether the insulating transformer input is the same with the actual supply voltage. If not, the user must act according to the actual supply voltage when wiring.

3.8 Electric flux winch

Hoist Water Proof Push Button Pendant Switch

A 220VAC power winch is mounted on a “L” post at the roof of the Girth welder, it provides a max. lifting capacity of 170 kg (375 lbs.) to lift welding flux up to 30m (98')[standard] below the Girth welder.

Please refer to the power Winch manual for details.

IV. INSTALLATION AND OPERATION

Correct installation and setup are critical to ensure proper operation of the BGW and welding equipment.

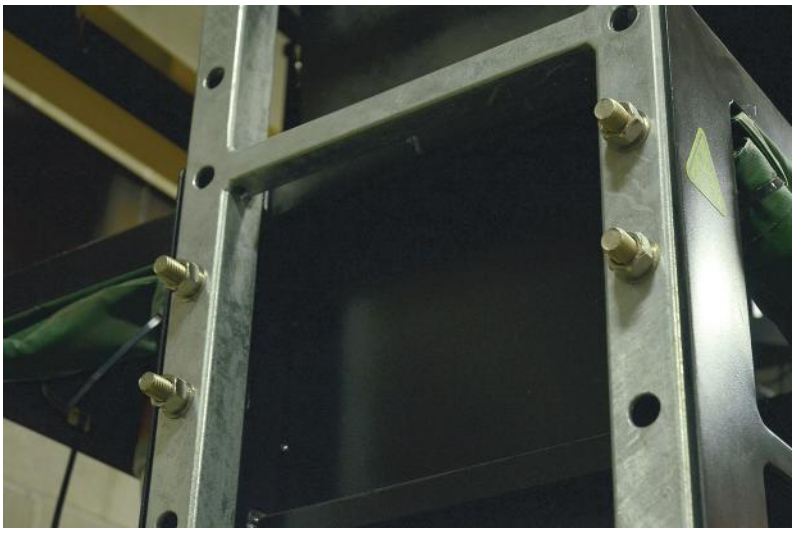
4.1 Frame Setup

4.1.1 Remove the machine from the crate. A lifting device capable of lifting 2000 kg (4409 lbs.) is required. Place a crane hook to the lifting eye and carefully upright the machine.

4.1.2 Remove the location pins of the four square tube members of the GIRTH WELDER; use the lifting device to adjust the height of the GIRTH WELDER to the size of the shell plate.

Relock the location pins when the appropriate position (pin holes) is found and apply a locking pin to secure the location pin at the appropriate pin holes on the square tubes.

These pin holes are drilled in an interval of 100mm (3 15/16").



4.1.3 Flux Hose Setup

4.1.4 Set the separator tank on the roof and connect flux hoses.

Extra flux hose line is required to be added to the installed hose when setting the machine for a higher shell plate. **<u>Except</u> the models with flux recovery systems fixed right on top of the operator platform.**

4.1.5 Adjust drive wheels of the travel mechanism to the diameters of the tank, then lock them into position.

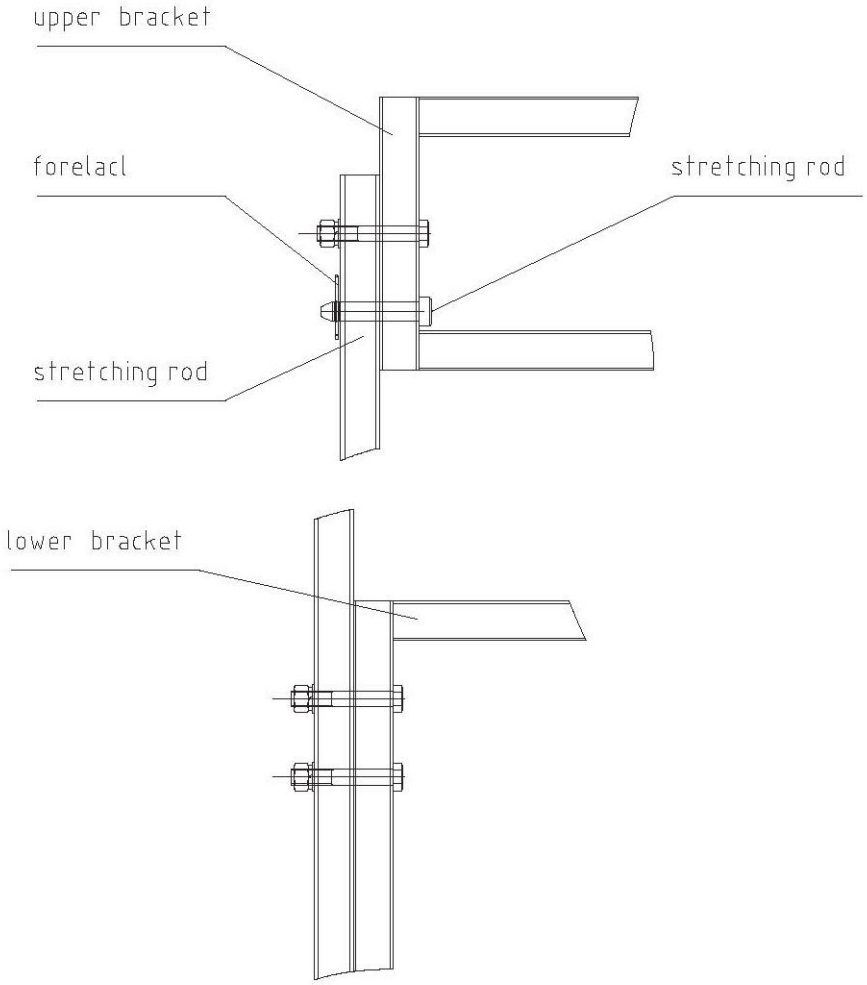
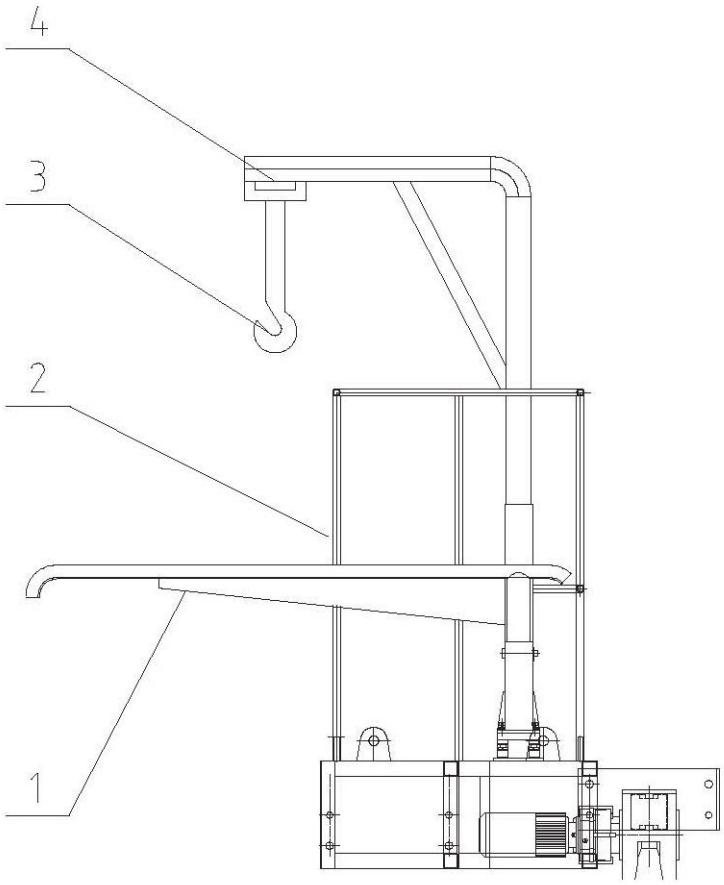


Fig. Square tube mechanism

4.1.6 Once the main frame is setup correctly, mount the cable hanger (1). Safety hand rail (2), electric flux winch (3) and flux lifting post (4), on the frame roof.



4.1.7 Mount the NA-3/MAXsa10 control and master control to the control mounting plate at the right hand side of the frame.

4.2 Master Control Connections

There are 9 sets of receptacles (8 sets for some models) at the side of the control panel, each receptacle is DIFFERENT and only can mate with the correct connectors of the below components:

a) Flux Vacuum
b) Main power
c) 220VAC/1ph aux output (for electrical hand tools such as grinder)
d) Laser pointer
e) Lighting
f) NA-3S control on/off
g) Dual motor drive
h) Flux lifting winch
i) Cooling fan

4.3 Installation

Dual Drive Motor fit up for tanks

There is a bolt that you can loosen to enable the wheels to pivot either way, this is to adjust the drive wheels to the tank radius. You can identify this bolt as it bolts through a machined slot which is in a curve/radius.

Note: even with this bolt loose the drive wheels cannot come off.

Two methods for tank tracking:

On the ground

1. Loosen the bolts, and use a soft faced hammer, wooden mallet, dead blow hammer or a normal hammer with a block of wood in between to “tap” the drive wheels into position so that they are set to the correct radius. You can check these on the ground by making a cardboard template of tank radius or use what we call a “sweep” or “radius” board if they have one- this is a template that tank builders used to check the shape of a vertical weld joint during and after welding- its usually a piece of steel with the tank radius cut on one face.

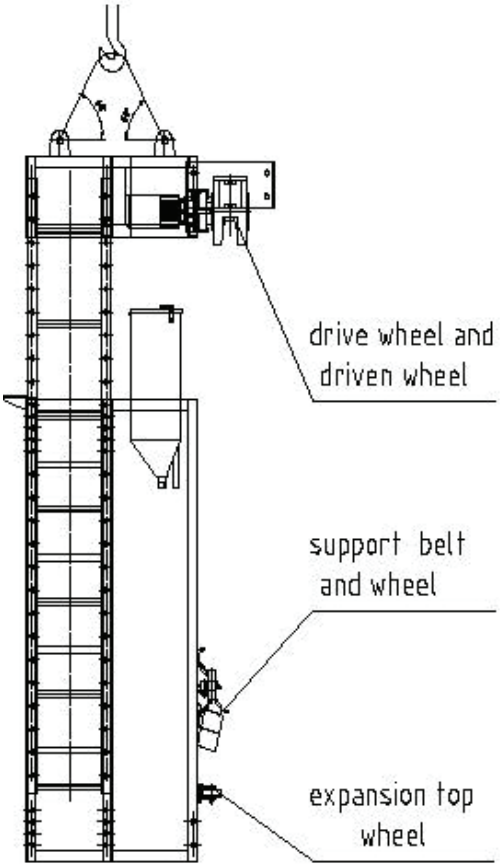
In the air/on tank

2. Loosen the drive wheel “pivot” bolts on the ground (x 2 through the machined curved slot in drive wheel housings)

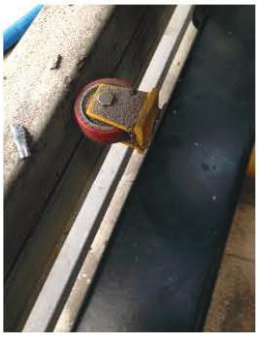
   Place the AGW in position in the tank and drive it around for a short distance- this should self- adjust the wheels to tank radius-if it does not use a hammer as above or crowbar to position the wheels to match the tank radius.

Just remember that even with the adjustment bolt loosened the tank drive wheels cannot come off and as the machine is straddling the tank.

When all components of the GIRTH WELDER are in place, hook up the lifting eyes at the roof of the GIRTH WELDER with crane and lift the frame off the ground, then hang the drive wheels on top of the plate wall and lower it down, so the flanged wheel would land on one of the shell plates top edge.



Note: For double sided unit, operator is required to expand the hydraulic jack above the operator platform to “open up” the hinged master and slave frame, allowing the opened “A” frame of the double sided unit to straddle on the shell plate.



4.3.1 While loading, angle between the lifting cable and the horizon should not be greater than 60°. The guide wheels should be extended to the maximum extension with the hand wheel, and then bolted at the position perpendicular to the ground surface. It provides a moving support to the frame and prevent impact between the flux belt systems and weld head to the shell plate during handling.

4.3.2 When the Girth welder is securely straddled on the shell plate, retract the support guide wheel by hand, wheel and then bolt the orientation of the support wheel to the horizontal position.

The weight of the Girth welder should then be supported by the flanged metal wheel at the top as well as the flux belt assembly.

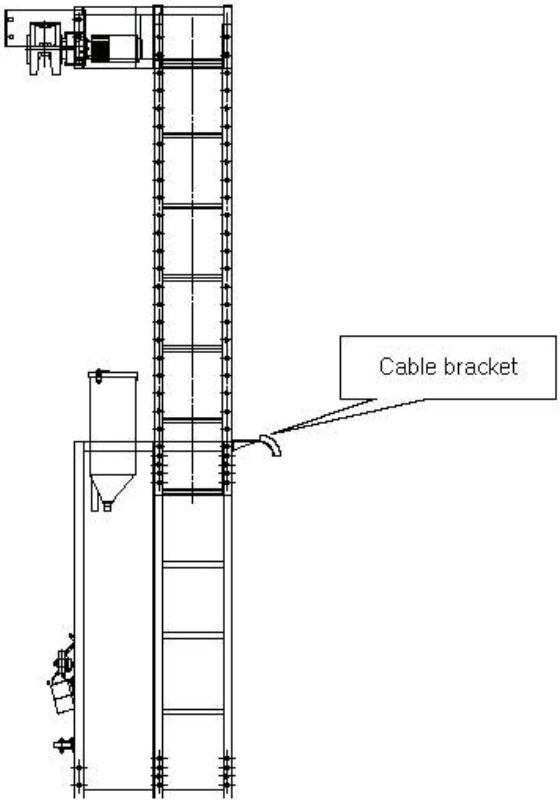
4.3.3 The welding power supply is intended to be located on the floor in the center of the storage tank. All of the cables are run from the power supply to the cable hanger at the roof of the machine frame.

All cable connections are made at this point and the hanger clamp fastened in a way that the connections themselves do not feel the strain of the cable weight.

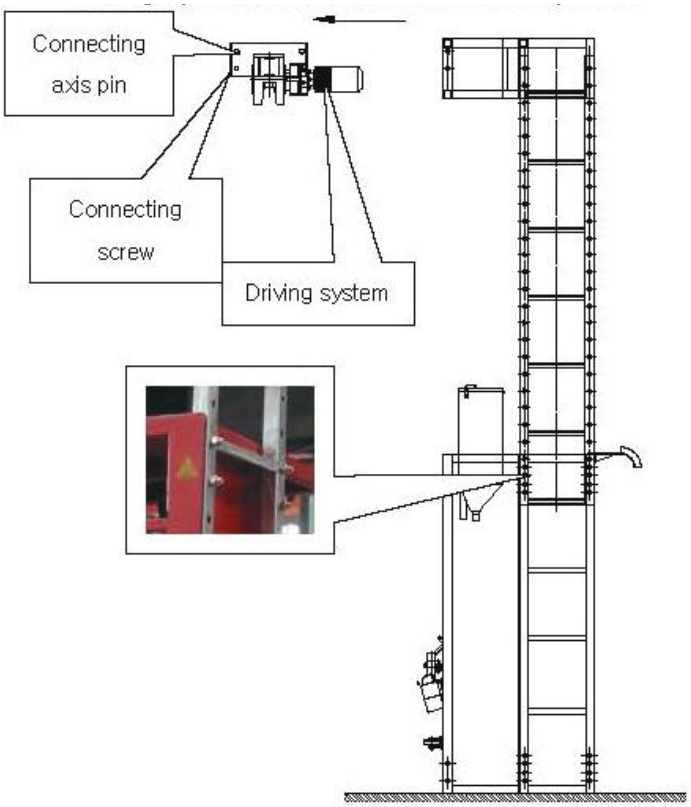
4.3.4 Locate the power supply storage near the center of the tank. The storage case contains the main power distribution disconnect, distribution transformer, and the welding power supply.

4.3.5 Procedures of transformation from top down GIRTH WELDER to bottom up one

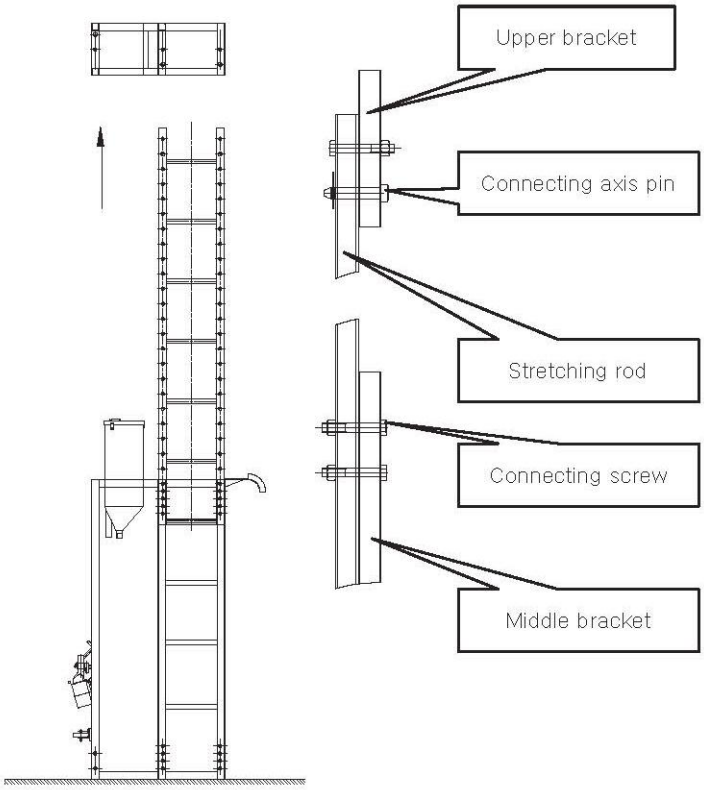
1. Top down state



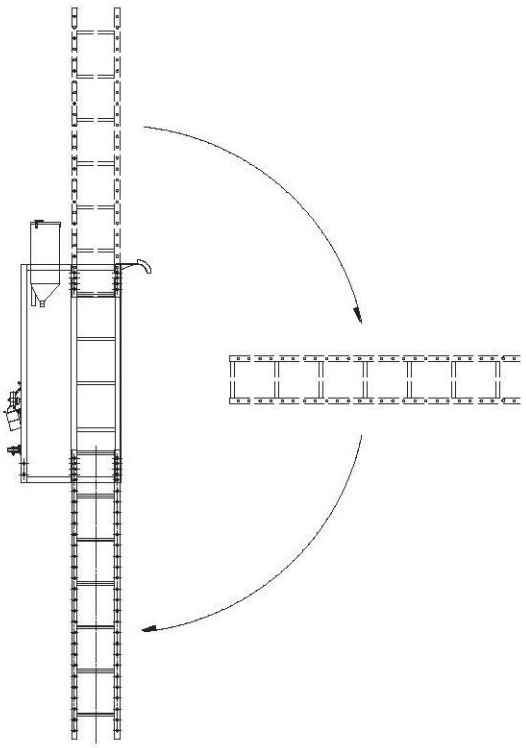
2. Put the equipment on the ground and release the screw connecting upper bracket and driving system, and disassemble the system.



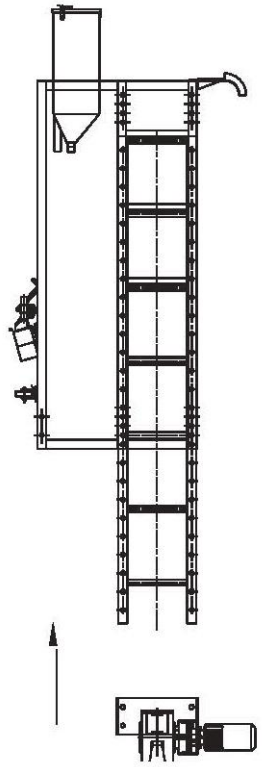
3. Release the screw connecting upper bracket and stretching rod, and dismantle the upper bracket and stretching rod.



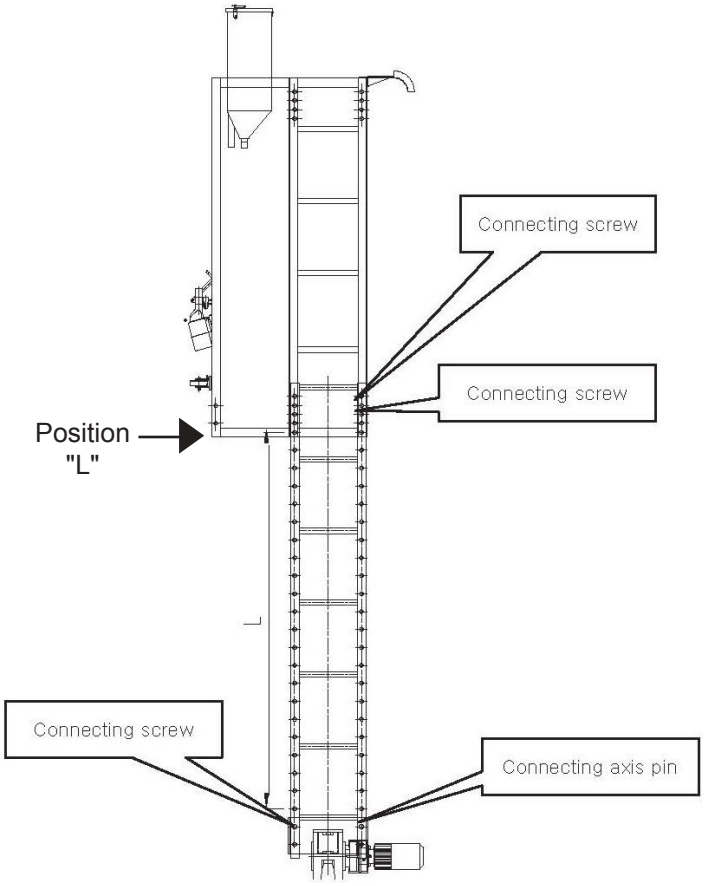
4. Rotate the stretching rod through 180 degrees.



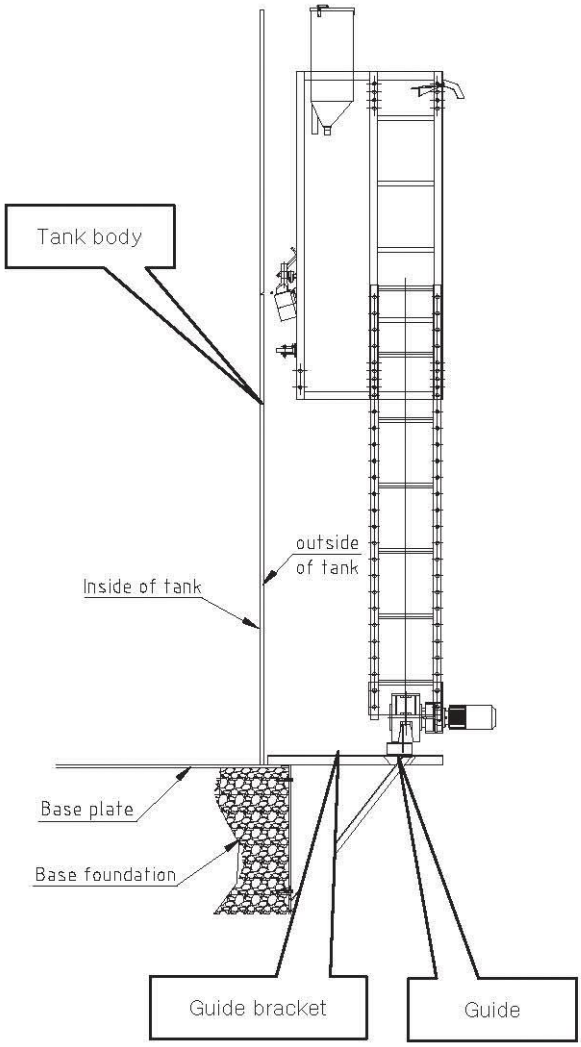
5. Install the disassembled driving system on the stretching rod.



6. Adjust position “L” connecting the stretching rod installed with driving system and middle bracket to satisfy the plate amplitude and tighten.



7. Put the equipment on the pre-set bottom up guide track.



4.4 Input Connection

⚠ WARNING!

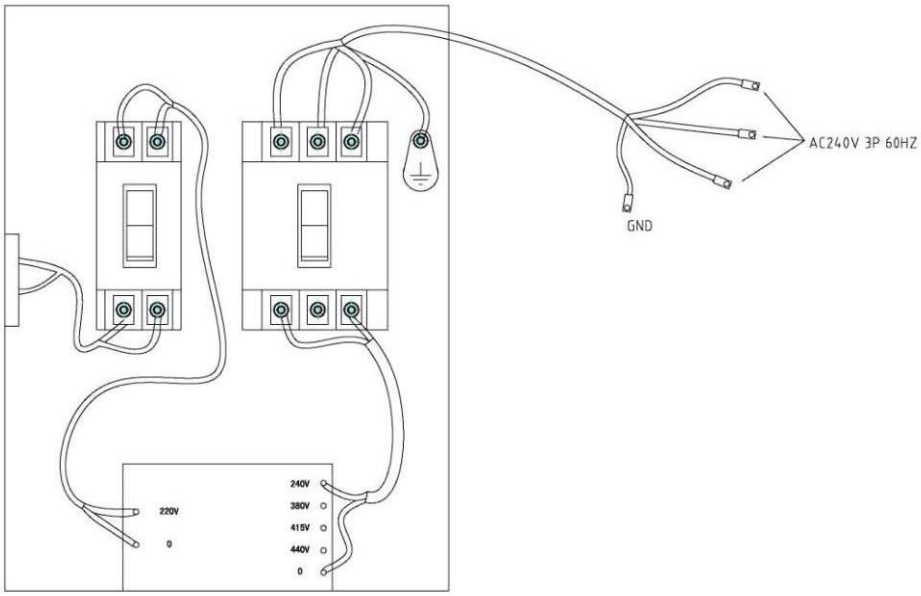
Only a qualified electrician should connect the input leads to the GIRTH WELDER. Connections should be made in accordance with all local and national electrical codes.

Connect three phase supply line (380V for standard GIRTH WELDER, 240V / 440V for special version) to L1, L2, L3 and ground to the input lug of the 3-phase circuit breaker inside the electrical cabinet as illustrated to the input supply connection diagram below.

Connect the output of the 3-phase circuit breaker with the welding power supply input.

The electrical cabinet also consists of a step down transformer and a secondary circuit breaker for 1 phase / 220V input to the GIRTH WELDER. The girth welders are shipped connected for the input voltage specified for the destination of the machine in factory.

NOTE: Please turn main input power of the machine OFF before performing reconnects procedure. Failure to do so will result in damage to the machine.



Example: non-standard input at 240V/3ph/60Hz connection.

4.5 OPERATION

1. Turn on the main power switch at the base of the power supply.
2. Turn on the main control with the switch located on the top right of the control panel.
3. Switch on the welding power source.
4. Positioning the flux belt system roughly 2-3 inches below the weld seam giving ample room to move the flux belt in and out to the exact position. By having the belt a little lower will remove some of the burning to the belt that may occur during the welding process.
5. Adjust the angle of the torch to roughly 15 degrees with a “Stick-out ¾" to 1" wire. Make sure that the tip of the wire is roughly a ¼ inch from the surface to be welded (bottom of the bevel or area to be welded).
6. Ensure that the laser pointer is aligned with the tip of the soldering wire, we suggest you use a level to get it as close as possible.
7. Program the parameters of welding (voltage, amperage and forward speed). NA-3 feeder switch **must** be in the “ON” position. Also make sure all emergency stop buttons are disengaged and that all breakers are in the correct position in the main power supply.
8. Cover wire and seal with a generous amount of flux. Wire should be completely covered in flux.
9. Switch on electrical flux hopper valve.
10. Turn on the lamp and vacuum flux on the main power source.
11. Place the switch of speed at the position of “WELD”.
12. Test first that the direction is correct and setup is proper before welding and before placing flux on belt to alleviate waste.

*** Test all the switches on the master control panel and monitor the LEDs (the LEDs are only available for

the later YS-GIRTH WELDER models).

NOTE: The GIRTH WELDER master control is powered by 220V/1ph VAC, please check for first time operation.

CAUTION: After switching off the inverter, please wait for at least 3 minutes before switching it on again. Quick repetitions to switch the inverter on and off could damage the inverter due to the residual voltage. Please refer to the inverter manual for details.

4.6 WELDING

1. In a rapid, succession turn the switch towards the left or right (depending on welding direction), press the 'START' in the NA-3 power source and finally turn the switch of the power supply unit NA-3 to the position "auto".
2. Monitor the voltage and amperage for welding and forward speed to ensure a good weld bead.
3. When finished welding, press the "OFF" button on the main control panel of the BGW-5000
4. For safety , press the "OFF" of the feeder NA-3.

NOTE: For models with electric flux valve option, the flux would feed automatically when the wire touches the work when the operator presses "inch down" to feed wire prior welding.

NOTE:

* For safety reasons, please power off the system before disconnecting any of the control cables to the master control.

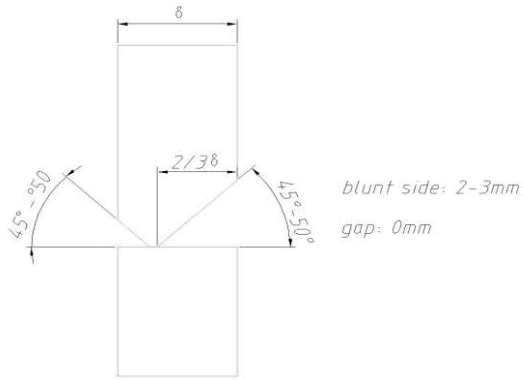
* In order to increase the consumed life of the flux belt mechanism, the user is recommended to extend the support guide wheels as the means of support when the GIRTH WELDER is not welding (flux belt must be firmly in contact with the shell plate during welding operation for flux recovery).

* Excessive suction force would prohibit flux feeding during the welding operation; adjust the vacuum hose valve if necessary.

4.6.7 If the machine is going to weld in the direction opposite of what it was previously set up for, simply shut down the manual hose valve at one side and open the hose valve at the other side.

V. WELDING PROCEDURE GUIDELINES

5.1 Joint Design



5.2 Typical Welding Parameters (for 3.2mm wire)

Wall Thickness (mm)	Voltage (V)	Amp (A)	Travel Speed in/min (mm/min)	Torch Angle	Shell Course
10-14	26-27	320-350	15-17 (380-420)	15°-20°	1st
	27-29	450-480	19-20 (480-520)		2nd
16-18	26-27	380-420	15-18 (380-450)	15°-20°	1st
	27-29	450-480	19-20 (480-520)		2nd
	28-31	450-520	20-26 (500-650)		3rd
20-22	26-27	380-420	15-18 (380-450)	15°-20°	1st
	27-29	450-480	19-20.5 (480-520)		2nd
	28-31	450-520	20-26 (500-650)		3rd
	28-31	470-520	22-26 (550-650)		4th
24-32	26-27	380-420	15-18 (380-450)	15°-20°	1st
	27-29	450-480	19-20 (480-520)		2nd
	28-31	450-520	20-26 (500-650)		3rd
	28-31	480-520	22-26 (550-650)		4th & up

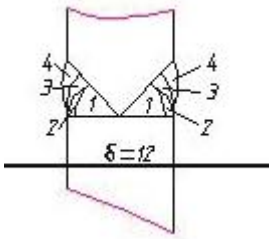
Note: The serviceability of a product or structure utilizing the information in these guidelines must be the sole responsibly of the builder. Many variables in design, fabrication and service conditions affect the results obtained in applying this type of information. BUG-O systems is not responsible for any welding parameters or guidelines for the BGW machines and or the SAW process.
Please have all parameters for SAW provided prior to the beginning of setup of machines.

We do offer a starting guide for parameters in our instruction manual, this is just a guide and not an exact set of parameters to be followed.

Wire Diameter Φ2.4mm; F = Front; B = Back

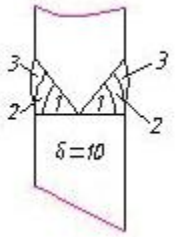
A) Shell Wall Thickness 12MM

WTδ=12	Current (A)	Voltage (V)	Travel Speed cm/min	
F(1)12mm	380 ~ 400	25 ~ 26	50 ~ 60	
B(1)12mm	360-380	25 ~ 26	50 ~ 60	
F(2)12mm	400	26	55 ~ 65	
B(2)12mm	380	25	55 ~ 65	
F(3)12mm	380	25	65 ~ 70	
B(3)12mm	380	25	65 ~ 70	
F(4)12mm	360	24 ~ 25	70 ~ 75	
B(4)12mm	350	24 ~ 25	70 ~ 75	



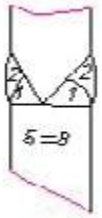
B) Shell Wall Thickness 10MM

WTδ=10	Current (A)	Voltage (V)	Travel Speed cm/min	
F(1)10mm	360 ~ 380	25 ~ 26	70 ~ 75	
B(1)10mm	360	26	70 ~ 75	
F(2)10mm	380	24 ~ 25	75 ~ 80	
B(2)10mm	360	24 ~ 25	75 ~ 80	
F(3)10mm	350	25	80 ~ 85	
B(3)10mm	320	24	80 ~ 85	



C) Shell Wall Thickness 8MM

WTδ=8	Current (A)	Voltage (V)	Travel Speed cm/min	
F (1)8mm	320	24	80 ~ 85	
B(1)8mm	300	23	80 ~ 85	
F(2)8mm	300	24	85 ~ 95	
B(2)8mm	280	24	85～95	



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Please have all parameters for SAW provided prior to the beginning of setup of machines.

We do offer a starting guide for parameters in our instruction manual, this is just a guide and not an exact set of parameters to be followed.

VI. TROUBLESHOOTING

Problems	Possible Causes	Recommended Action
Improper control or feeding of welding wire.	Lincoln welding control or power supply is abnormal.	1. Check all fuses 2. Check Lincoln control switch is “on” and polarity switch on the power supplies must be in “+” or “-”. 3. Review Lincoln service manuals and diagnose possible PCBs failures.
The indication light of master control fails to ignite.	1. Power supply is off. 2. 3 pin control cable connector is loose. 3. 3 pin control cable is bad.	1. Turn on power supply. 2. Check 3 pin connector 3. Check 3 pin control cable
Flux vacuum cannot operate	1. Bad vacuum relay in the control. 2. Vacuum itself is faulty	1. Replace control relay/switch 2. Replace flux vacuum
Lamp is off	1. Bad lighting relay in the control. 2. Control cable is loose or bad 3. Light bulb is bad.	1. Replace relay / switch 2. Check control cable & connector 3. Replace light bulb.
Electric winch does not work	1. Control cable is loose or bad. 2. Winch failure	1. Check control cable & connector 2. Replace winch.
Main frame cannot travel.	1. Bad travel direction switch 2. Bad speed potentiometer 3. Bad travel control relay 4. Incorrect inverter setting 5. Faulty inverter 6. Indicator Light “TRAVLE READY” is off.	1. Replace switch 2. Replace potentiometer 3. Replace relay 4. Check inverter setting * 5. Replace inverter 6. Refer to following row
Indicator Light “TRAVEL READY” is off	1. Bad Indicator Light. 2. Switch Selector of NA3 control is turned to “OFF”. 3. Bad sequence relay KA1 4. Sequence relay KA1 is loosen.	1. 1. Replace indicator Light 2. 2. Turn the switch selector to “ON” or “AUTO” 3. Replace sequence relay KA1 4. Fix sequence relay KA1
Main frame travels at manual mode but not under auto mode.	1.Welding control faults	1. Check welding control *** Please refer to Lincoln PF10A/NA3 manual for details.**

Vacuum fails to recover flux	1. Both flux valves are open. 2. Air leak at the flux hoses. 3. Flux valves are incorrectly adjusted. 4. Vacuum is blocked.	1.Close one of the valves 2. Repair or replace flux recovery hose. 3. Adjust flux valves. 4. Check vacuum.
No flux feeding	1. Flux inlet valve is too close. 2. Flux hose leakage	1. Adjust and open up flux valve. *** refer to 3.6.2 Vacuum degree adjustment device** 2. Repair or replace flux recovery hose.
Insufficient amount of flux is recovered.	1. Suction nozzle is too far from the weld. 2.Wrong flux suction nozzle setup	1. Adjust suction head position. 2. Adjust suction head angle.
Flux belt is burnt by slag	1. Flux support belt too close to the weld seam. 2. Weld travel is off.	1. Adjust the distance to 15 – 25mm. 2. Switch on weld travel.

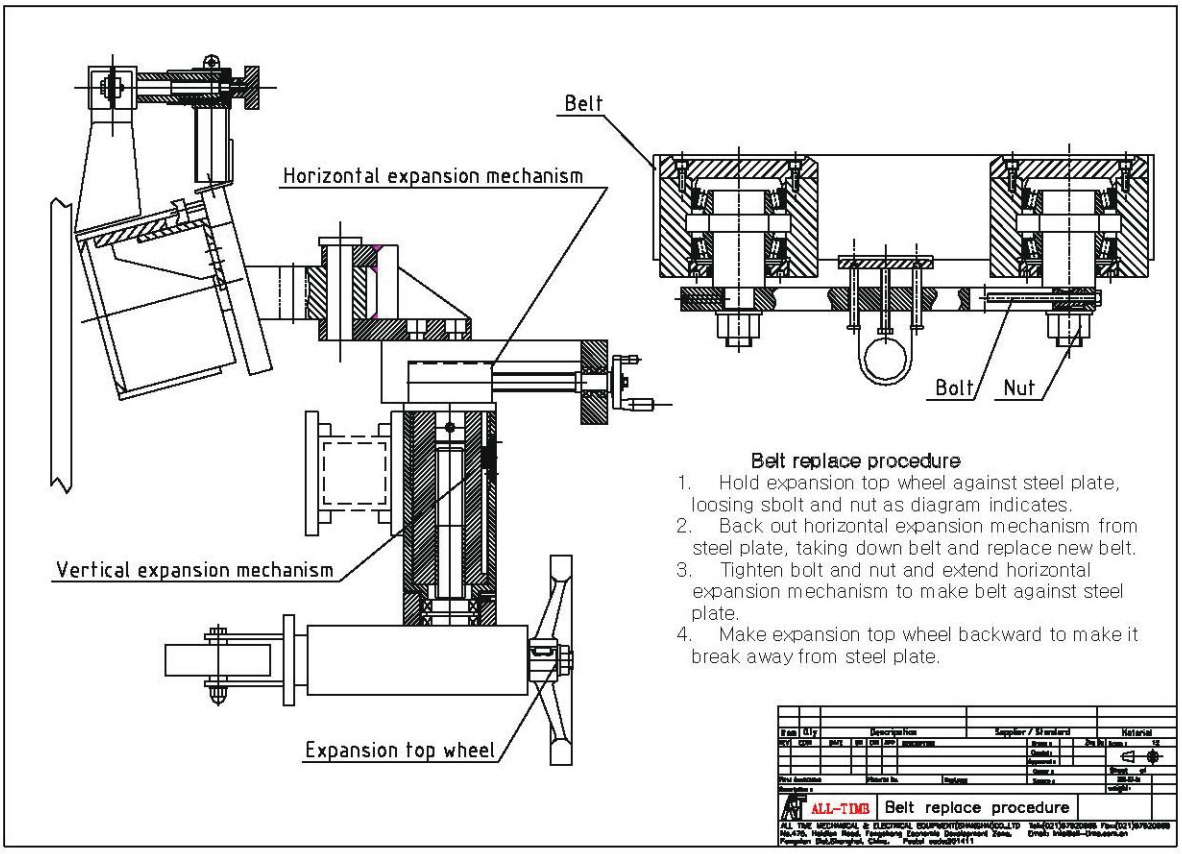
Note: The electrical circuitry of the BGW is straightforward and can usually be traced through by a local electrician using the electrical schematic diagram included in this manual.

Consult factory if all the above measures fail to resolve the problem.

VII. MAINTENANCE

7.1 Flux belt must be properly adjusted, during operation, the latex flux belt should be snug and both roll centerlines are parallel. Overly tight belt tension would cause the rollers to skew, bending both rollers and cause the belt to roll off.

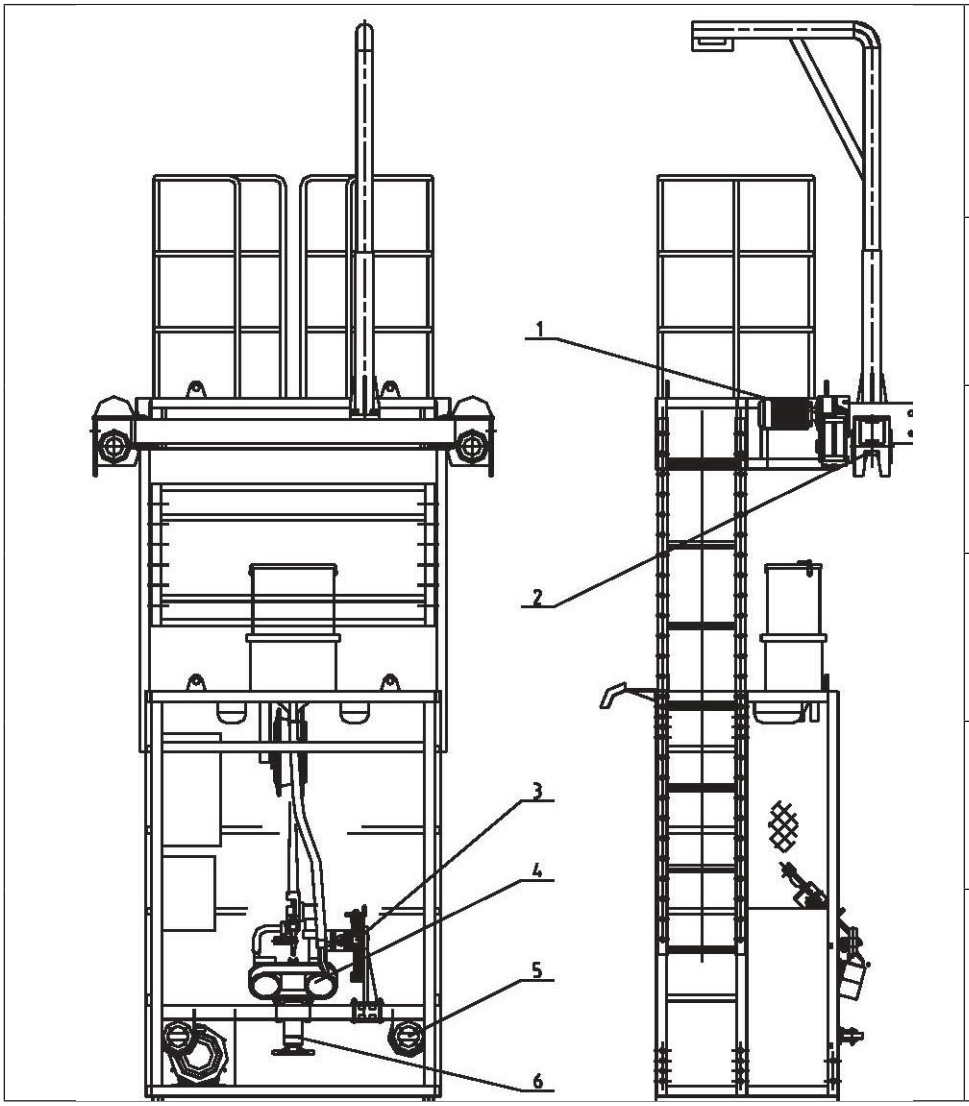
Flux belts are considered as consumables and should be replaced when it is worn or seriously burned.



7.2. Lubrication

Both SEW motors and reducers of the GIRTH WELDER drive system should be regularly lubricated, please refer to SEW operating instruction manuals for detail maintenance instructions.

(See next page) The lubricant that is added to the equipment before they go out, can handle surrounding temperatures of -10 to 50° (14 degrees to 122 degrees F). Once exceeding the range, please add proper lubricant according to the local temperature.



1. SEW motors and reducer: Refer to SEW operating instruction manuals for detail
2. drive wheel: Bearing
3. Cross slide lead screw, bearing
4. rotary wheel: bearing
5. Guide Wheel Ass: lead screw, bearing
6. Vertical slide: lead screw, bearing

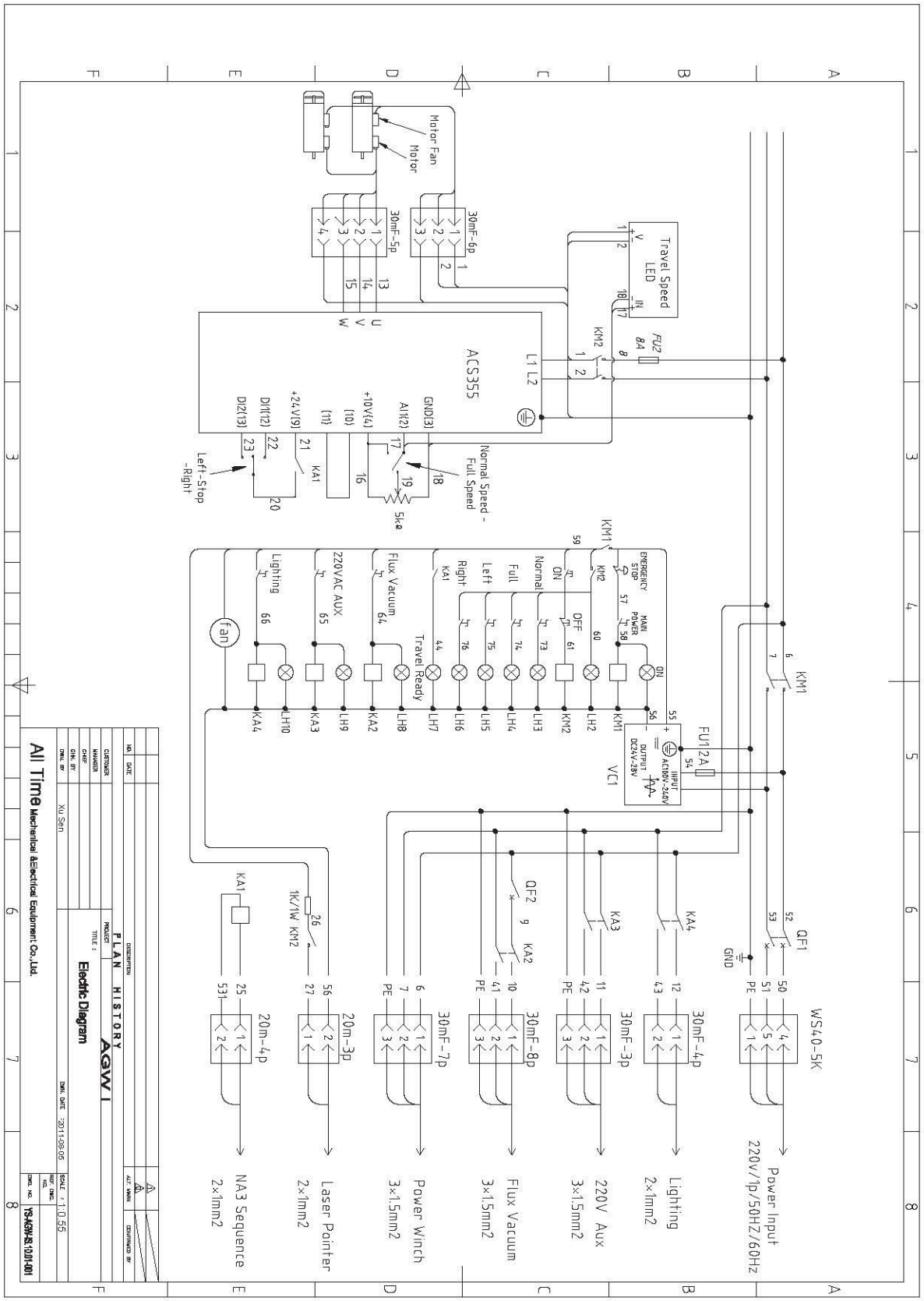
Schematic diagram of the lubrication points

7.3 The serrated flanged drive wheel would need to be replaced if it is worn and loses the necessary grip to keep the Girth welder travel steadily on the tank shells.

7.4 Check the flux recovery system
Clean the flux hopper filter every day and replace the filter every two weeks

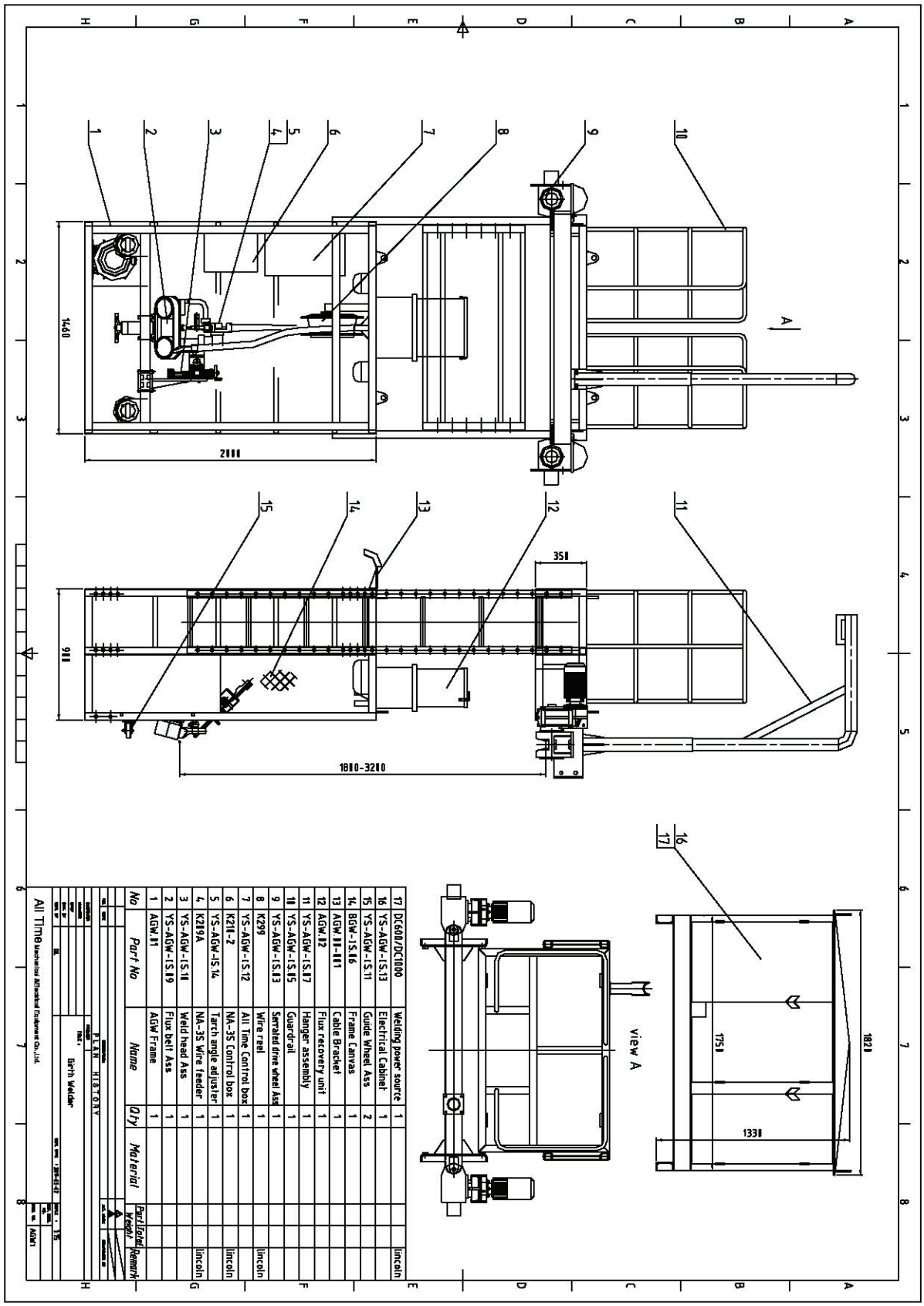
VIII. DIAGRAM

8.1 Electric diagram



8.2 Technical diagram

BGW-5000

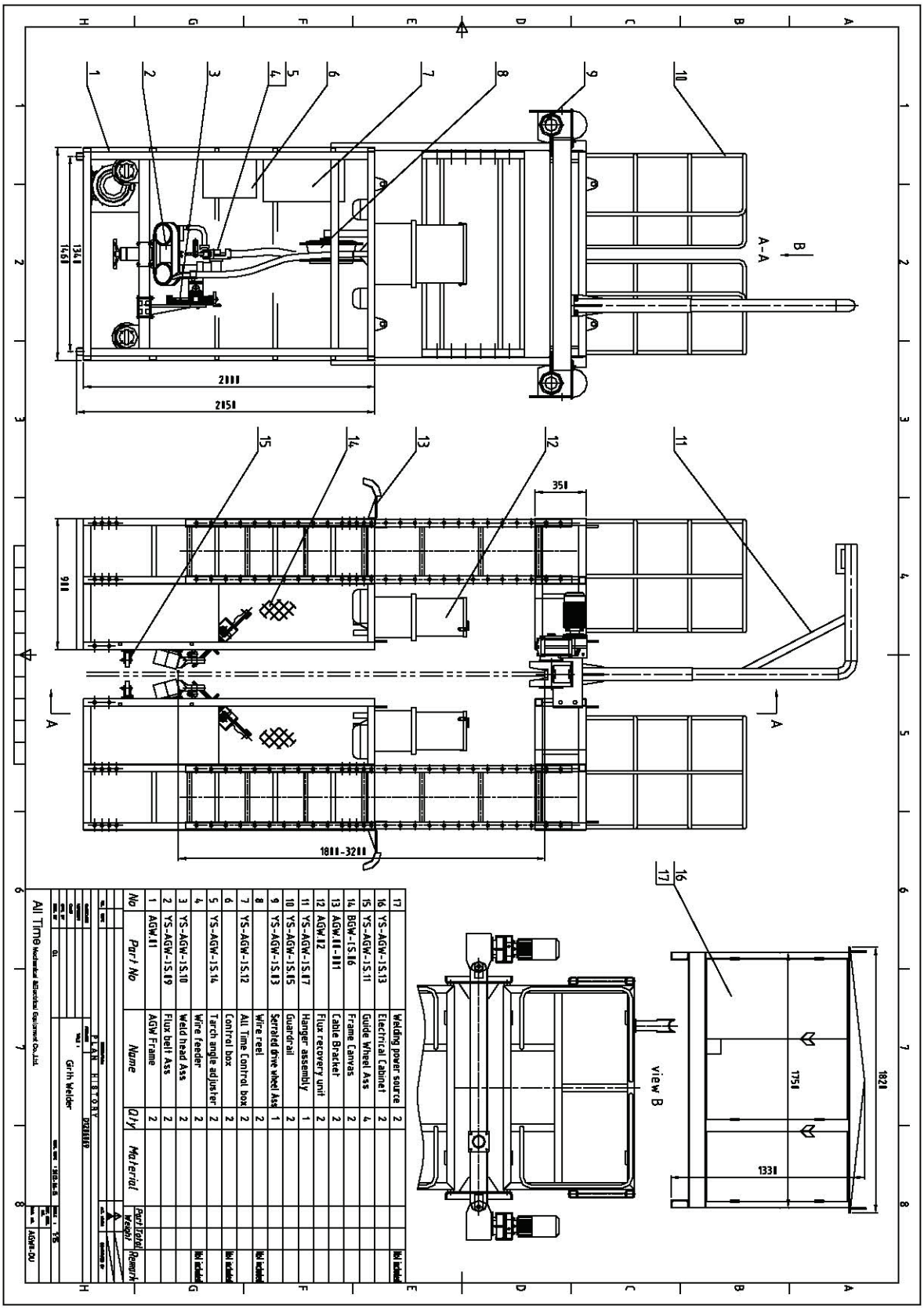


No	Part No	Name	Q'ty	Material	Weight	Parc/Total	Remark
17	DC600/DC1000	Welding power source	1				lincoln
16	YS-AGW-IS.13	Electrical Cabinet	1				
15	YS-AGW-IS.11	Guide Wheel Ass	2				
14	BGW-IS.16	Frame Canvas	1				
13	AGW.11-001	Cable Bracket	1				
12	AGW.12	Flux recovery unit	1				
11	YS-AGW-IS.17	Hanger assembly	1				
10	YS-AGW-IS.15	Guardrail	1				
9	YS-AGW-IS.13	Serrated drive wheel Ass	1				
8	K299	Wire reel	1				lincoln
7	YS-AGW-IS.12	All Time Control box	1				
6	K211-2	NA-35 Control box	1				lincoln
5	YS-AGW-IS.14	Torch angle adjuster	1				
4	K219A	NA-35 Wire feeder	1				lincoln
3	YS-AGW-IS.10	Weld head Ass	1				
2	YS-AGW-IS.09	Flux belt Ass	1				
1	AGW.01	AGW Frame	1				

All Time Machinery Manufacturing Co., Ltd.

Girth Welder

AGW1



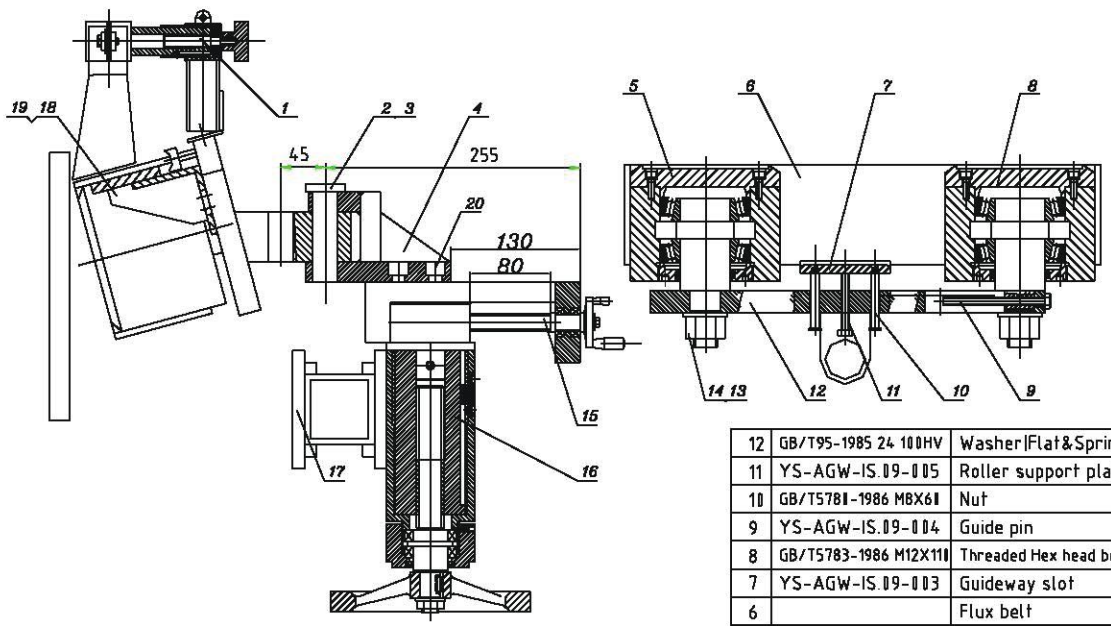
No	Part No	Name	Q'ty	Material	Part Total Weight	Remark
16	YS-AGW-1S.13	Welding power source	2			Not included
15	YS-AGW-1S.11	Electrical Cabinet	2			
14	BGW-1S.16	Guide Wheel Ass	4			
13	AGW.11-001	Frame Canvas	2			
12	AGW.12	Cable Bracket	2			
11	YS-AGW-1S.17	Flux recovery unit	2			
10	YS-AGW-1S.15	Hanger assembly	1			
9	YS-AGW-1S.13	Guardrail	2			
8		Serrated drive wheel Ass	2			Not included
7	YS-AGW-1S.12	Wire reel	1			
6		All Time Control box	2			Not included
5	YS-AGW-1S.14	Control box	2			
4		Torch angle adjuster	2			Not included
3	YS-AGW-1S.10	Wire feeder	2			
2	YS-AGW-1S.19	Weld head Ass	2			Not included
1	AGW.11	Flux bell Ass	2			
		AGW Frame	2			

All Time Mechanical Fabrication Equipment Co.,Ltd.

PLAN HISTORY

Girth Welder

AGW-0U



No	Drawing No.	Name	Qty	Material	Part Weight	Total Weight	Remark
19	GB/T70-1985 M12X25	Bolt	4				
18	GB/T70-1985 M10X20	Bolt	2				
17	YS-AGW-IS.09.006	Belt support plate	1				
16	YS-AGW-IS.09.01-001 1/2	Mount plate	1				
15	YS-AGW-IS.09.02	Vertical slide	1				
14	YS-AGW-IS.09.01	Horizontal slide	1				
13	GB/T6170-1986 M24	Nut	2				
12	GB/T95-1985 24 100HV	Washer Flat&Spring	2 ea				
11	YS-AGW-IS.09-005	Roller support plate	1				
10	GB/T5781-1986 M8X60	Nut	2				
9	YS-AGW-IS.09-004	Guide pin	1				
8	GB/T5783-1986 M12X110	Threaded Hex head bolt	1				
7	YS-AGW-IS.09-003	Guideway slot	1				
6		Flux belt	1				
5	YS-AGW-IS.09.04	Head Swivel rib	1				
4	YS-AGW-IS.09-002	Head support rib	1				
3	GB/T91-1986 5X50	Pin sleeve	1				
2	YS-AGW-IS.09-001	Connect Pin	1				
1	YS-AGW-IS.09.03	Nozzle clamp asembly	2				

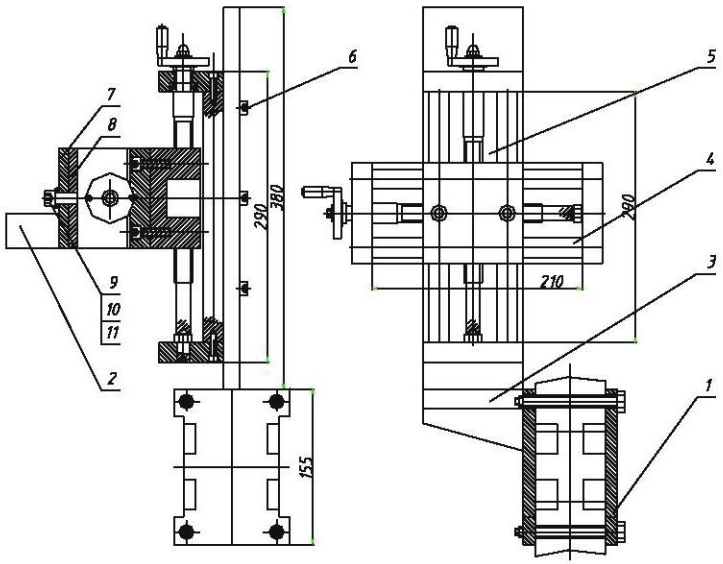
PLAN HISTORY

Flux Belt Assembly

Flux Belt Assembly

ALL-TIME All Time Mechanical &Electrical Equipment Co.,Ltd.

YS-AGW-IS.09



No	Drawing No.	Name	Qty	Material	Remark
6	GB70-85	Hex. socket head bolt M8X70	7		
5	YS-AGW-IS.10.02	Cross slide 250	Assembly		250
4	YS-AGW-IS.10.01	Cross slide 210	Assembly		210
3	YS-AGW-IS.10-001	Mount Block	Weld part		
2	K209A	LINCOLN Weld gear	1		
1	YS-AGW-IS.09.02-001/2	Hinge bracket	2		

No	Drawing No.	Name	Qty	Material	Remark
11	YS-AGW-IS.10-004	Insulated Washer	2	Ø22Terafluoreethylene	
10	GB848-85	Washer 10	2		
9	GB70-85	Hex. socket head bolt M10X40	2		
8	YS-AGW-IS.10-003	Insulated plate	1	t5 Ebonite sheeting	
7	YS-AGW-IS.10-002	Head Mounting plate	1	Q235	

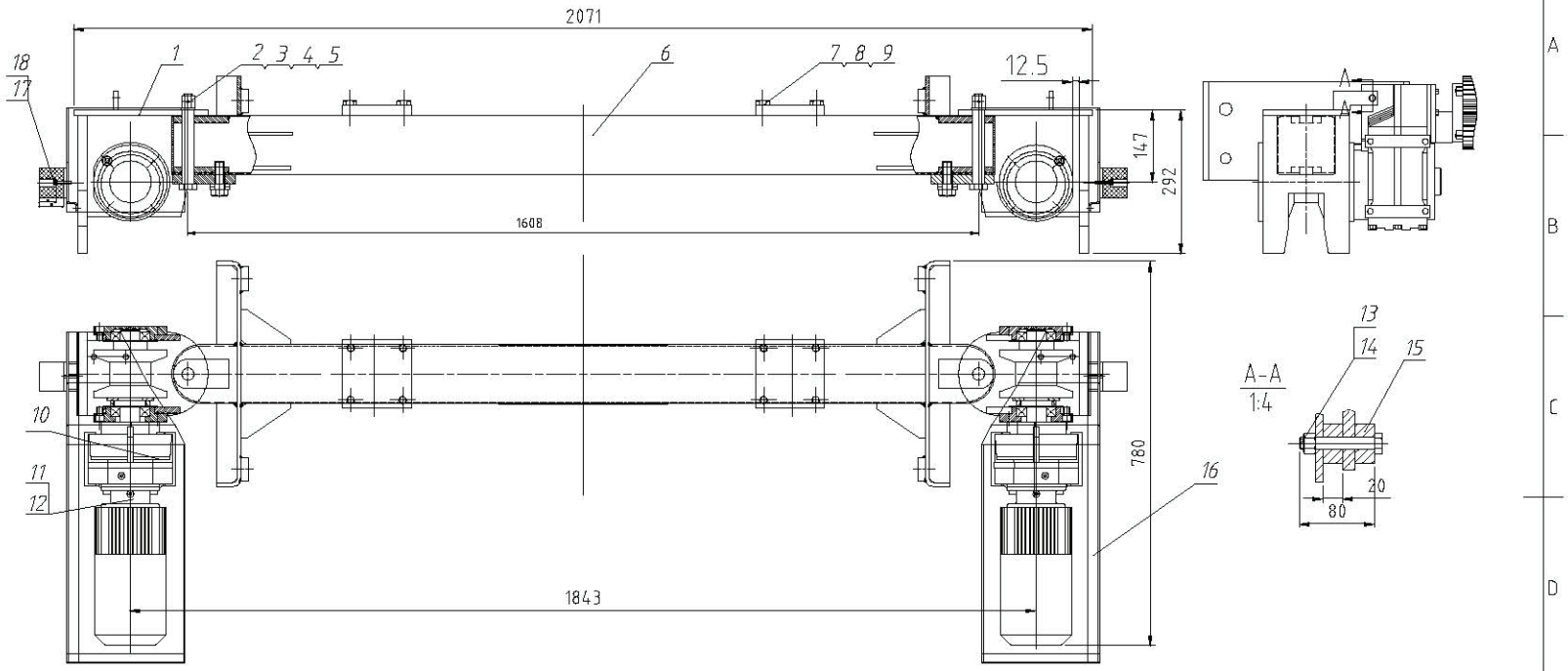
PLAN HISTORY

NO.	BASE	DESCRIPTION	ALT. MARK	CONFIRMED BY

CUSTOMER
MANAGER
CHIEF
CHK. BY
DRW. BY

PROJECT: Weld head assembly
TITLE: Weld head assembly
DRW. DATE:
SCALE: 1:4
REV. DRG. NO.
DRG. NO. YS-AGW-IS.10

ALL-TIME All Time Mechanical &Electrical Equipment Co.,Ltd.



18	GB/T70.1—1986	Hexagon socket countersunk head screws M6*30	2	
17	YS—AGW—IS.03—006	bumper	2	
16	YS—AGW—IS.03—004	cover shell	2	
15		Shock absorb pad	2	
14	GB/T95—1985 20 100V	Combined washer	1	
13	GB/T5780—1986 M12X85	Bolt	1	
12	YS—AGW—IS03—003	Washer for reducer	1	
11	GB/T5783—1986 M12X45	Bolt	1	
10	FA47/GDM71D4	Reducer & motor	1	
9	GB/T93—1985	Spring washer 16	1	
8	GB/T95—1985	Washer 16	2	
No	Drawing No.	Name	Qty	Remark

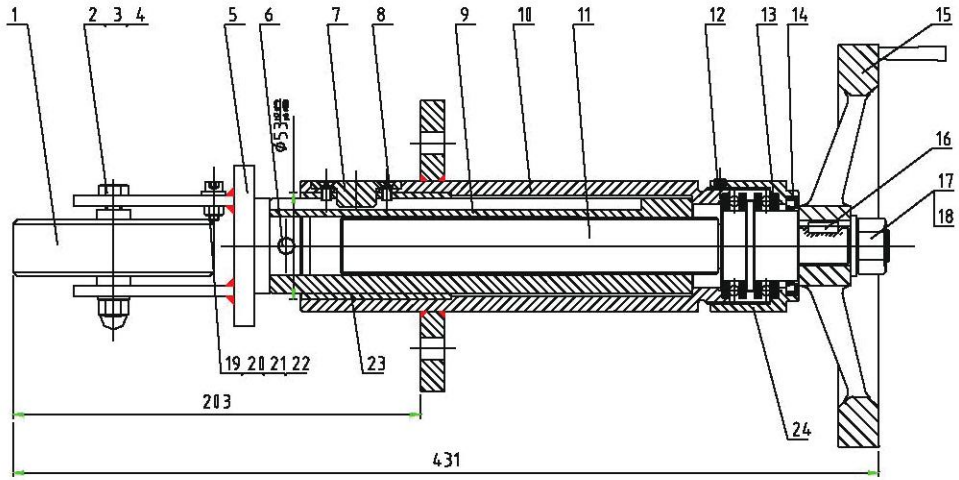
7	GB/T5783—1986	Hexagon head bolt M16X45	2	
6	YS—AGW—IS.03—002	Drive wheel beam	1	
5	GB/T91—1986 4X50	Bolt	2	
4	GB/T95—1985 16 100V	Washer	2	
3	GB/T56—1988 M16	Nut	2	
2	YS—AGW—IS03—001	Bolt sleeve	2	
1	YS—AGW—IS.03.01	Drive wheel assemly	2	
No	Drawing No.	Name	Qty	Remark

NO. DATE DESCRIPTION ALT. MARK CONFIRMED BY

PLAN HISTORY

CUSTOMER PROJECT Serrated Drive Wheel Assembly
MANAGER TITLE : Serrated Drive Wheel Assembly
CHIEF
CHK. BY
DWN. BY DWG. DATE : SCALE : 1:7
REF. DWG. NO.

ALL-TIME All Time Mechanical &Electrical Equipment Co.,Ltd. DWG. NO. YS-AGW-IS.03



No	Drawing No.	Name	Qty	Material			Remark
24	YS-AGW-IS.11-008	Sleeve cover	1	45			
23	YS-AGW-IS.11-007	Copper sleeve	1	QSn7-0.2			
22	GB/T93-1985	Spring washer	1				
21	YS-AGW-IS.11-009	Stainless stell pin ϕ2	1	L=170			
20	GB/T6173-1986	Nut M5	1				
19	GB/T80-2000	Hex socket bolt M5X16	1				
18	GB/T95-1985	Washer16	1				
17	GB/T6173-1986	NutM16	1				
16	GB/T1096-1979	Pin 6X15	1				
15	JB/T7273.3-1994	Handle B18X200	1				
14		Enclose ring ϕ35X49X6	1				
13	GB/T301-1995	Thrust ball bearing51107	2				
12	GB/T80-2000	Hex socket bolt M6X4	1				
11	YS-AGW-IS.11-006	Thread rod	1				
10	YS-AGW-IS.11-005	Bar Housing	1				
9	YS-AGW-IS.11-004	Sleeve	1				
8	GB/T68-2000	Slotted counter sunk bolt M5X8					
7	YS-AGW-IS.11-003	Guilding block	1				
6	YS-AGW-IS.11-002	Pin	1	Q235A			
5	YS-AGW-IS.11-001	Roller frame	1				
4	GB/T95-1985	Washer8	1				
3	GB/T802-1988	Cap nut M8	1				
2	GB5781-1986	Bolt M8X60	1				
1	YS-AGW-IS.11.01	Roller	1				

PLAN HISTORY

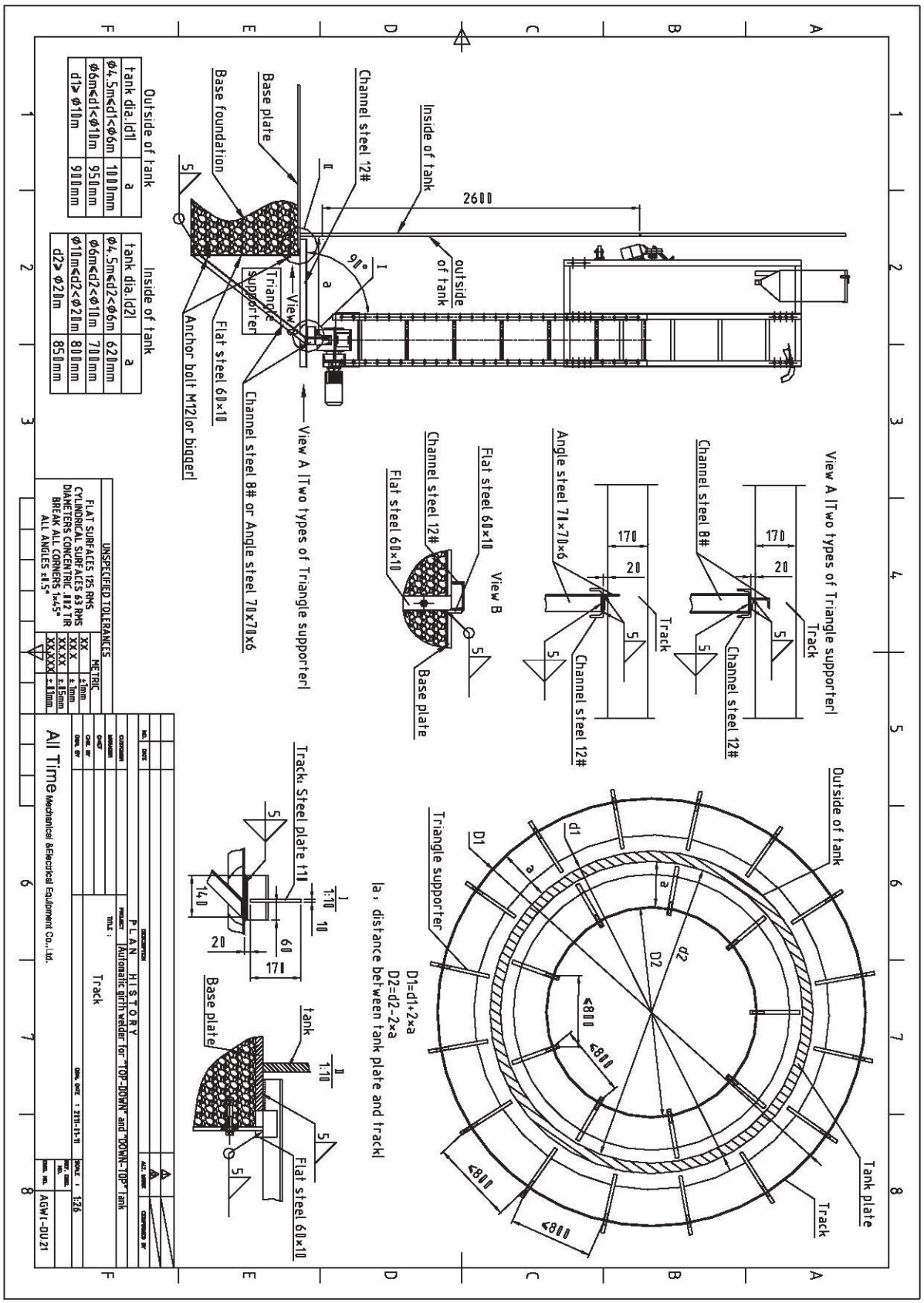
Guide Wheel Assembly

Guide Wheel Assembly

ALL-TIME All Time Mechanical &Electrical Equipment Co.,Ltd.

YS-AGW-IS.11

8.3 Guide setup diagram of bottom up girth welder



SPARE PARTS KIT

SPK-BGW-1000*

Parts included:

PART NO.	QTY	DESCRIPTION	PART NO.	QTY	DESCRIPTION
BGW-1006	4	Flux Belt	BGW-1207	20	3.2 mm Contact Tip
BGW-1007	5	Flux Vacuum Filter	BGW-1208	20	2.4 mm Contact Tip
BGW-1008	1m	Flux Feed Hose	BGW-1209	2	Extension Nozzle Assembly
BGW-1009	1m	Flux Recovery Hose	BGW-1211	2	Extended Nozzle
BGW-1011	1	Flux Pickup Nozzle	BGW-1212	1	Electric Flux Valve
BGW-1013	1	Inverter Drive Unit	BGW-1213	1	Laser Pointer
BGW-1014	1	Drive Current Display	BGW-1214	1	Flux Feed Nozzle
BGW-1016	1	Flux Vacuum	BGW-1215	1	Frame Support Roller
BGW-1017	1	Relay (KA1)	BGW-1217	1	Multi turns potentiometer (RP1)
BGW-1031	1	Lamp	BGW-1218	5	Fuse (power input)
			BGW-1219	5	Fuse (inverter)

*Must be ordered with every BGW unit
Can be ordered separately

WARRANTY

Limited Warranty*

Model _____
Serial No. _____
Date Purchased: _____

For a period of twelve (12) months from delivery, BUG-O Systems warrants to the original purchaser (does not include authorized distributors), that a new machine is free from defects in material and workmanship and agrees to repair or replace, at its option, any defective parts or machine. This warranty does not apply to machines, which after our inspection, are determined to have been damaged due to neglect, abuse, overloading, accident or improper usage. All shipping and handling charges will be paid by customer.

BUG-O Systems makes no warranty of merchantability and makes no other warranty, expressed or implied, beyond the warranty expressly set forth above. Buyer's remedy for breach of warranty, hereunder, shall be limited to repair or replacement of non-conforming parts and machines. Under no circumstances shall consequential damages be recoverable.

HOW TO OBTAIN SERVICE:
If you think this machine is not operating properly, re-read the instruction manual carefully, then call your Authorized BUG-O dealer/distributor. If he cannot give you the necessary service, write or phone us to tell us exactly what difficulty you have experienced. BE SURE to mention the MODEL and SERIAL numbers.

*Bug-O System's warranty applies to Bug-O components only. Where other brands of power sources, wire feeders or sub components are a part of Bug-O Equipment, please refer to that specific Manufacturer's manual for warranty specifications on their components.