

**IRIZAR**

# WELDING ROTATORS WR & SAR Series

## OPERATION MANUAL



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Note: The information contained in this manual is intended to be accurate. However the manufacturer retain the rights to make changes in design which may not be include herein

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## 1. Safety Requirements



### WARNING ARC WELDING MAY BE DANGEROUS

*PROTECT YOURSELF AND OTHERS FROM POSSIBLE SERIOUS INJURY OR DEATH, KEEP CHILDREN AWAY. PACEMAKER WEARERS SHOULD CONSULT WITH THEIR DOCTOR BEFORE OPERATING.*

Read and understand the following safety highlights, *BE SURE THAT ALL INSTALLATION, OPERATION, MAINTENANCE AND REPAIR PROCEDURES ARE PERFORMED ONLY BY QUALIFIED INDIVIDUALS.*



#### 1. *ELECTRIC SHOCK can kill*

- The electrode and work (or ground) circuits are electrically “hot” when the welder is on, do not touch these “hot” parts with your bare skin or wet clothing.
- Insulate yourself from work and ground using dry insulation. Make certain the insulation is large enough to cover your full area of physical contact with work and ground.
- In semiautomatic or automatic wire welding, the electrode, electrode reel, welding head, nozzle or semiautomatic welding gun are electrically “hot”.
- Always be sure the work cable makes a good electrical connection with the metal being welded, the connection should be as close possible to the area being welded.
- Ground the work or metal to be welded to a good electrical (earth) ground.
- Maintain the electrode holder, work clamp, welding cable and welding machine in good, safe operating condition. Replace damaged insulation.
- Never dip the electrode in water for cooling.
- Never simultaneously touch electrically “hot” parts of electrode holders connected to two welders because voltage between the two can be the total of the open circuit voltage of both welders.
- When working above floor level, use a safety belt to protect yourself from a fall should you get a shock.



#### 2. *ARC RAYS can burn*

- Use a shield with the proper filter and cover plates to protect your eyes from sparks and the rays of the arc when welding or observing open arc welding. Head shield and filter lens should conform to nation standard.
- Use suitable clothing made from durable flame-resistant material to protect your skin and that of your helpers from the arc rays.
- Protect other nearby personnel with suitable, non-flame able screening and warn them not to watch the arc nor expose themselves to the arc rays or to hot spatter or metal.



#### 3. *FUMES AND GASES can be dangerous*

- Welding may produce fumes and gases hazardous to health, Avoid breathing these fumes

and gases. When welding, keep your head out of the fume. Use enough ventilation and exhaust at the arc to keep fumes and gases away from the breathing zone.

- Do not weld in locations near chlorinated hydrocarbon vapors coming from degreasing, cleaning or spraying operations. The heat and rays of the arc can react with solvent vapors to form phosgene, a highly toxic gas, and other irritating products.
- Shielding gases used for arc welding can displace air and cause injury or death. Always use enough ventilation, especially in confined areas, to insure breathing air is safe.
- Read understand the manufacturer's instructions for this equipment and the consumables to be used, including the material safety data sheet and follow your employer's safety practices.



#### 4. *WELDING SPARKS can cause fire or explosion*

- Remove fire hazards from the welding area, if this is not possible; cover them to prevent the welding sparks from starting a fire. Remember that welding sparks and hot materials from welding can easily go through small cracks and openings to adjacent areas. Avoid welding near hydraulic lines.
- Where compressed gases are to be used at the job site, special precautions should be used to prevent hazardous situations.
- When not welding, make certain no part of the electrode circuit is touching the work or ground. Accidental contact can cause overheating and create a fire hazard.
- Do not heat, cut or weld tanks, drums or containers until the proper steps have been taken to insure that such procedures will not cause flammable or toxic vapors from substances inside.
- Vent hollow castings or containers before heating, cutting or welding. They may explode.
- Sparks and spatter are thrown from the welding arc. Wear oil free protective garments such as leather gloves, heavy shirt, cuff less trousers, high shoes and a cap over your hair. Wear ear plugs when welding out of position or in confined places. Always wear safety glasses with side shields when in a welding area.
- Connect the work cable to the work as close to the welding area as practical. Work cables connected to the building framework or other locations away from the welding area increase the possibility of the welding current passing through lifting chains, crane cables or other alternate circuits. This can create fire hazards or overheat lifting chains or cables until they fail



#### 5. *FOR ELECTRICAL powered equipment (apply in to welding and cutting equipment)*

- Turn off input power using the disconnect switch at the fuse box before working on the equipment.
- Install equipment in accordance with J. IRIZAR COMPANY LTD's recommendations
- Ground the equipment in accordance with our recommendations



#### 6. *Other*

- Keep all equipment safety guards, covers and devices in position and in good repair. Keep hands, hair, clothing and tools away from V-belt, gears, fans and all other moving parts

when starting, operating or repairing or repairing equipment.

- In some cases it may be necessary to remove safety guards to perform required maintenance requiring their removal is complete. Always use the greatest care when working near moving parts.
- Do not put hands near the running fan, do not operate with panel open or guards off.



#### 7. *ELECTRIC AND MAGNETIC FIELDS may be dangerous*

- Electric current flowing through any conductor causes localized Electric Magnetic Fields (EMF). Welding current creates EMF fields around welding cables and welding machines.
- EMF fields may interfere with some pacemakers, and welders having a pacemaker should consult their physician before welding.
- All welders should use the following procedures in order to minimize exposure to EMF fields from the welding circuit:
  - a. Rout the electrode and work cables together –Secure them with tape when possible.
  - b. Never coil the electrode lead around your body.
  - c. Do not place your body between the electrode and work cables. If the electrode cable is on your right side, the work cable should also be on your right side.
  - d. Connect the work cable to the workpiece as close as possible to the area being welded.
  - e. Do not work next to welding power source.

## 2. Summarize

Welding rotator is advanced welding positioning equipment mainly used assembling and welding pipe, containers, boilers, pressure vessels, oil tank and other cylinder's shapes. Available Conventional Welding Rotators (WR SERIES) and Self Aligned Welding Rotators (SAR SERIES).

WR Series roller is used for the rotation of the work piece through the friction between the power frame roller and the work piece, which can adjust the angle between the rollers group to fit the different diameter of the work piece. The roller rotation adopts AC motor driving, inverter speed adjusting with wide range of speed adjustment, smooth rotation and low speed advantage.

SAR Series self-aligning roller bed is used for the rotation of the work piece through the friction between the power frame roller and the work piece, which can automatically adjust the angle between the rollers group to fit the different diameter of the work piece, no need manual adjustment; The roller rotation adopts Y series motor driving, its speed adjusting with wide range of speed adjustment, smooth rotation and low speed advantage.

## 3. Structure characteristics

### 3.1 WR Series

- ✓ The machine consists of 1 set of driving roller, 1 set of idler roller and electric control system.
- ✓ Driving roller frame is consists of 2 drive rollers and 1 pedestal. The Idler roller frame is consists of 2 idler roller and 1 pedestal.
- ✓ The rollers are equipped on the support bracket, through moving the support bracket by screw realize adjust of rollers center distance to suitable the difference diameter of work-piece between 45° ~ 110°

- ✓ Each roller on driving frame is driven by separate one motor and reducer achieves rotating. Working principle of the roller: Direct-type motor reducer- make roller rotating, the wheels linear speed 100 up to 1,000 mm/min
- ✓ The gear reducer is made by our company, which have low noise, big torque and stabilized speed and so on.
- ✓ The rollers are assembled by metal roller and rubber roller, with heavy loading and strong driving.
- ✓ Control system consists of control board and remote box. With the control speed characteristic of large range and lasting torque, control speed smoothly, no torque puissant; corresponding power adopts transducer with low noise, high capacity and various function. Signals adopt simulator control; speed display adopts high precision digital display and high stability. In addition, control board's height is light and volume is small, which is installed at the end of pedestal according to using requirements or put it on the ground separately.

### 3.2 SAR Series

- ✓ The Welding Rotators consists of 1 set of driving roller, 1 set of idler roller and electric control system.
- ✓ Driving roller frame is consists of 2 drive rollers and 1 pedestal. The Idler roller frame is consists of 2 idler roller and 1 pedestal.
- ✓ Each roller on driving-frame are driven by one motor and reducer, achieve rotating. Working principle of the roller: Y series motor – single input and double output worm wheel decelerator – make roller rotating, the wheel linear speed 100 up to 1,000 mm/min.
- ✓ The gear reducer is made by our company, which have low noise, big torque and stabilized speed and so on.
- ✓ The rollers are assembled by metal roller and rubber roller, with heavy loading and strong driving.
- ✓ Control system consists of control board and remote box. With the control speed characteristic of large range and lasting torque, control speed smoothly, no torque pulsate.

## 4. Operation Commissioning

4.1 The drive roller and idle roll must be put on a foundation in same horizon. Two sets of rollers must be parallel and the ground horizontal plane must be even.

4.2 The worm wheel decelerator of the machine uses lubricating oil, other gears and bearings use grease lubrication, periodic change. Note: the lubricating oil isn't installed into the machine at shipping, the users must add lubricating oil, and then begin to use.

4.3 The work piece put at roller, after; observe first a position of work whether seemly? Does the work piece stick to roller tightly. On the work piece whether have the dynamic foreign body which will hinder to revolve (such as; need not of steel bar), when normal of everything, can to run the machine.

- 4.4 Wiring: see the electric principle diagram, see clearly the AC motor's wire, and its wire is star circuit (Y), every phase voltage is as per data plate of the equipment.
- 4.5 Turn on the power switch ,Before start to rotation ,select (FWD) forward or (REV) reverse, the AC motor run ,make speed setting potentiometer clockwise turning, the roller revolve clockwise accelerating , counterclockwise ,speed decelerates, push STOP button, motor stop.
- 4.6 Make the sports such as forward or reverse. In spite of, while needing to change the direction, must turn to the stop position first, waiting motor stop, and then push the contrary direction button to change the direction.
- 4.7 The welding rotators should be working smoothly with no vibration or unusual noise. If so, stop immediately and trouble shoot.
- 4.8 Various the welding experiment, when put the work piece on the rotation, must consult relevant the manual carry on.
- 4.9 Equipment is after using to complete, keep the center of load gravity stability, then cut off the power supply.

## 5. Attention items and checking

- 5.1 Operator must be training of the operation technical ability knowledge, and carry on to the following important point to study in earnest, strictly forbid someone carry on various operation under blindness.
- 5.2 In the normal circumstance, the installation of rotator had better adopt the bolt to fix originally.
- 5.3 When finished installation, check whether tight firmware of each port loosens to move the phenomenon or not, if have, please tighten them immediately.
- 5.4 Before the usage check the machine and clear some bar the on board, the rubber roller cannot get in touch with oil, and keep off the heat possibly. These will prevent gum the gum roller to aging.
- 5.5 Check whether the electricity each operation button is failure or not, indicator whether by rule designation.
- 5.6 The rotation of roller whether normal, and the control of YCT series electromagnetic adjustable speed motor is failure or not.
- 5.7 When welding, equipments must have the credibility to connect ground wire, to insure the safety, can't connect directly to roller, the in order to prevent damage bearings.
- 5.8 If the equipments break down, cut off the power supply immediately, then carry on check or

maintain, and then continue to use.

5.9 The external connects of control box must accord with the electricity system diagram conjunction, careful check, cannot connect wrong.

5.10 Check usually

- ✓ Switch on electricity and not open to control the box, check the movement of the equipments from the exterior, and confirm to have no excrescent circumstance.
- ✓ Running performance according to standard norm of the function sign.
- ✓ Surroundings environment meets to request.( have no rain water, have no causticity air and the heat environment)
- ✓ Indicator parts are normal.
- ✓ Have no excrescent voice, vibration and smell.
- ✓ Has no over hot or change color etc circumstance.

5.11 Periodical check

- ✓ When periodically checking, stop the movement first, cut off the power supply and open the control device cover.
- ✓ Power supply electric voltage is within the scope of allow.
- ✓ Clear the dust of controller.
- ✓ The electric cable of insulates the circumstance, if there is damage should stop usage immediately to check to fix.
- ✓ Various connector parts, if have already loosen to move, the tight solid rear can use.
- ✓ Control each electric appliances of circuit component, if have damage piece and can affect to act or become to break down hidden trouble, must take into the repair.

## 6. Lubrication and maintenance

6.1 The reducer of this equipments all adopts the lubricant lubrication, the open type wheel gear and bearings adopt the grease lubrication.

6.2 Before using, reducer box need to add the oil to the mark centerline, while running should usually watch the oil height, add the lubricant of the same oil in time.

6.3 Lubricate and grease periodically. Replace initial change of oil at 300 hours and dispose properly of used oil. Replace every 6 months.

6.4 While already had no usage with long hours, while restarting should replace the lubricant and lubricate grease .

6.6 **GEAR BOXES** must be lubricated prior start the equipment. Use **MOBIL OIL DTE 24 or equivalent**. When first time use, change oil after one month, and then change oil every half year

6.7 **GEARS and SHAFTS** use lubrication grease **MOBIL GREASE DTE 25 or equivalent**. Check grease every month.

## 7. The parameter of inverter and adjustment

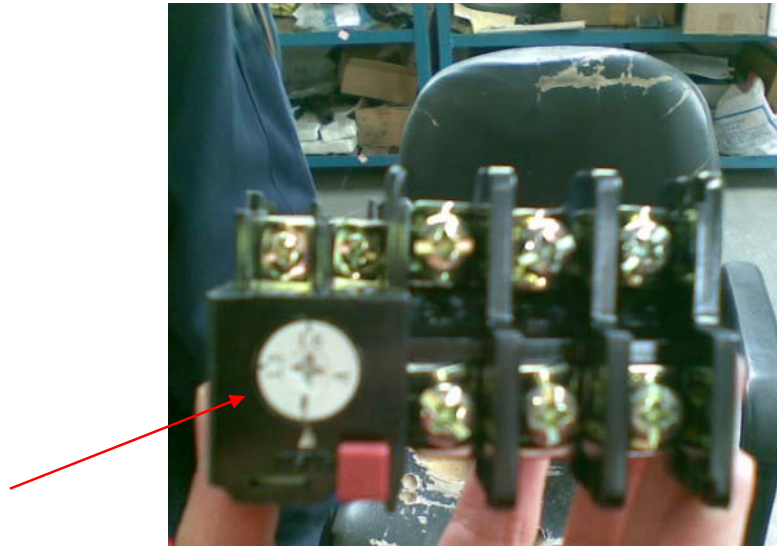
7.1 The digital indicator shows the rotation speed, if the speed shown is out of accordance with actual speed, adjust the potentiometer on the electricity control panel in the box, make indicator value and actual values to agrees.

7.2 When over load or short circuit phenomenon occurs, inverter will alarm on automatically, and stop output.

7.3 Reset or change the parameter of inverter, detailed read to the machine manual. 8.4 The electricity principle diagram sees attach the page

## 8. Troubleshooting

Trouble	Causation	Method
Rotation act malfunction	<ol style="list-style-type: none"> <li>input power wrong</li> <li>motor over load</li> <li>inverter run wrong</li> <li>motor malfunction</li> <li>contactor, relay malfunction</li> </ol>	<ol style="list-style-type: none"> <li>adjust it</li> <li>examine gear box</li> <li>examine it</li> <li>examine it</li> <li>replacing</li> </ol>
Speed and display differ	RP2 malfunction	Adjust or replacing
Inverter or transducer act malfunction	Read its manual	Read its manual
Rotation motor run but speed cannot change	<ol style="list-style-type: none"> <li>potentiometer malfunction</li> <li>inverter malfunction</li> </ol>	<ol style="list-style-type: none"> <li>examine it</li> <li>read its manual</li> </ol>
Speed display is not accurately	<ol style="list-style-type: none"> <li>No DC+5V input</li> <li>potentiometer normal</li> <li>indicator malfunction</li> </ol>	examine it replacing examine it
Inverter stops when running at low speed	1. not enough current going into the motors	1. adjust overheat protective relay to the max value (see picture below)



OVERHEAT PROTECTIVE RELAY

## 9. Warning

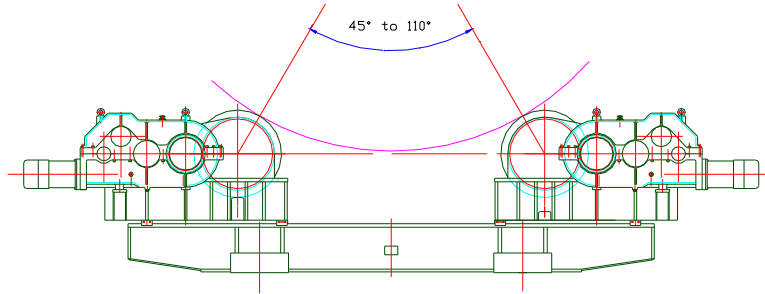


### WARNING

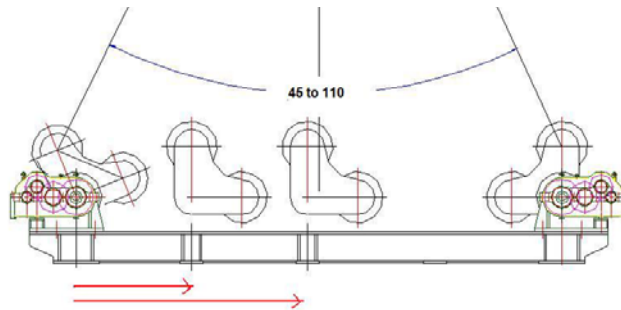
"Overload or misuse of a **Welding Rotator** can cause **PROPERTY DAMAGE, BODY INJURE OR DEATH**. Before operating read carefully and understand the information below. If you have any questions or concerns, please contact us @ 1 877 IRIZAR1 or [jirizar@jirizar.com](mailto:jirizar@jirizar.com)

1. **LIMITED WARRANTY: "ANY REPAIR OR MODIFICATION MADE BY UNAUTHORIZED THIRD PARTIES WITHOUT WRITTEN CONSENT SHALL VOID THIS WARRANTY"**
2. Welding Rotators **MUST NOT** be loaded with a work piece (vessel/pipe) exceeding the diameter on its data plate. This can leads to an accident running away the vessel from the welding rotators.
3. Welding Rotators **MUST NOT** be loaded with a work piece with a diameter less than the minimum indicated on its data plate. Doing that, motor and reducers may be damaged.
4. Center to center distance between wheels **MUST BE** adjusted on Conventional Welding Rotators WR SERIES prior the work piece has been sit on rollers. Adjustment is made by means of pre-drilled holes on the rotators' frame. **ANGLE MUST BE ON RANGE 45° ~**

110°.



- Center to center distance between wheels **MUST BE** adjusted on same Custom Built Self Aligned Welding Rotators SAR SERIES prior the work piece has been sit on rollers. Adjustment is made by means of pre-drilled holes on the rotators' frame. **ANGLE MUST BE ON RANGE 45° ~ 110°. ALWAYS FOUR WHEELS MUST HAVE CONTACT WITH VESSEL**



- Welding POWER Rotator **MUST NOT BE USED** if one of the two motors is **DEFECTIVE OR NOT WIRE CONNECTED**, since **OPERATION MAY LEAD TO DAMAGE GEARS OR GEAR BOXES**.
- TIGHT BOLTS TO THE CHART SPACES** below after the center to center wheels has been adjusted as per note # 3 and # 4 above.

8.8 BOLTS TYPE	
BOLT DIAMETER	NEWTONS *METER
M12	100
M14	160
M16	245
M20	480
M24	835
M30	1640
M36	2875

- Welding Rotators are factory shipped **WITHOUT LUBRICATION**. **ROTATORS MUST BE LUBRICATED PRIOR TO USE TO AVOID PERMANENT DAMAGE**. **GEAR BOXES MUST BE FILLED WITH MOBIL OIL DTE 24 OR EQUIVALENT**. **GEARS AND SHAFTS**

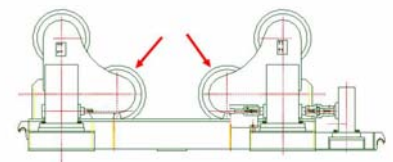
**MUST BE LUBRICATED WITH MOBIL GREASE DTE 25 OR EQUIVALENT.**

9. **NARROW RINGS/SHELLS ARE INSTABLE ON ROLLERS AND MUST NOT BE SEAT ON THEM FOR SAFETY REASONS.** The maximum acceptable ring/shell diameter VS width: **RING DIAMETER / RING WIDTH < 2.0**
10. Two Power Rotators Rotator **MUST NOT** be used together if they **ARE NOT EQUIPED WITH AN IRIZAR SINCRONIZED DEVICE** which allows the turning rolls to rotate at the same speed by means of a control box. Not using a synchronizing device may lead to damage gear boxes, burn motors, or cause other problems.
11. Welding Rotator **MUST NOT** exceed load and/or rotation capacity on sheet below. Exceeding the load capacity of a roller may lead to a serious accident.

Model	Power Rotator		Idler Rotator	Power Rotator + Idler Rotator
	Rotation (tons)	Load (tons)	Load (tons)	Rotation & Load (tons)
WR 3	3	1.5	1.5	3
WR 5, SAR 5	5	2.5	2.5	5
WR 10, SAR 10	10	5	5	10
WR 20, SAR 20	20	10	10	20
WR 40, SAR 40	40	20	20	40
WR 60, SAR 60	60	30	30	60
WR 80, SAR 80	80	40	40	80
WR 100, SAR 100	100	50	50	100
WR 150, SAR 150	150	75	75	150
WR 250, SAR 250	250	125	125	250
WR 400	400	200	200	400
SAR 500	500	250	250	500
WR 600	600	300	300	600
WR 800	800	400	400	800
WR 1000	1000	500	500	1000
WR 1200	1200	600	600	1200

12. Self Aligned Welding Rotator **MUST NOT** exceed 70% its standard load capacity, if vessel sits **ONLY** in his bottom wheels. See sheet bellow

Model	Power Rotator	Idler Rotator	Power Rotator + Idler Rotator
	Load (tons)	Load (tons)	Rotation & Load (tons)
SAR 5	1.75	1.75	3.5
SAR 10	3.5	3.5	7
SAR 20	7	7	14
SAR 40	14	14	28



SAR 60	21	21	42
SAR 80	28	28	56
SAR 100	35	35	70
SAR 150	52.5	52.5	105
SAR 250	87.5	87.50	175
SAR 500	175	175	350

13. Welding Rotators **MUST NOT** be operated without periodic safety inspection

14. Welding Rotators **MUST NOT** be operated for un-trained worker

## 10. T Verter Re-Set Procedure

If the T-Verter needs to be reprogramed, input the data corresponding to the T verter model of the machine is needed. Table below shows the set value and the function code for each model in order for the machine to work properly.

To set values on T-verter follow the next steps:

- Press “DSP FUN” until “000Fn” appears on display.
- Press arrows “up and down” to go to desire function code.
- After finding function, press “READ ENTER” to get into function code.
- Press arrows “up and down” to change value of function code.
- To change decimal place press “< RESET”.
- After input the value of the function code, press “READ ENTER” to save value.
- Press arrows “up and down” to go to next function code.

NOTE: Function Fn-123 will reset to factory settings. Use this if functions have been change randomly. After resetting to factory settings, input data of functions according to the chart below.

Refer to T-verter manual for more information about function description and applications.

**Type: N2-200/400**

Function code	set value
Fn01	10
Fn02	10
Fn03	0
Fn05	1 or 10
Fn06	60
Fn07	3
Fn10	1
Fn11	2
Fn46	1
Fn47	111
Fn98	1011
Fn72	0
Fn76	0

**Type: 7300CV--- SV300**

Function code	set value
Fn 1-00	1
Fn 1-01	0
Fn 1-02	0
Fn 1-06	2
Fn 3-00	60
Fn 3-01	6
Fn 3-17	0
Fn 4-00	0
Fn 5-00	0
Fn 5-01	1
Fn 5-05	18
Fn 5-06	23
Fn 9-08	0
Fn 9-09	0
Fn 9-10	0
Fn 10-0	10 or 11 or 12

**Type: 7200MA**

Function code	set value
Bn-01	5
Bn-02	5
Bn-10	0
Bn-12	0
Bn-13	2
Bn-14	1
Bn-15	1
Sn-02	09 or 10
Sn-04	1
Sn-05	1
Sn-10	0
Sn-20	0
Sn-24	0
Sn-33	0

Tables 10.1: T-verter function codes and set values.