

# MANUAL BOOK



## **WT-315DP / WT-400DP**

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**DC INVERTER**

**DOUBLE PULSE TIG**

**WELDING MACHINE**

## SAFETY PRECAUTIONS

**Follow these precautions carefully. Improper use of any welder can result in injury or death.**

1. ONLY CONNECT WELDER TO A POWER SOURCE FOR WHICH IT WAS DESIGNED. The specification plate on the welder lists this information. When welding outdoors only use an extension cord intended for such use.
2. ONLY OPERATE WELDER IN DRY LOCATIONS and on cement or masonry floor. Keep area clean and uncluttered.
3. KEEP ALL COMBUSTIBLES AWAY FROM WORK SITE.
4. DO NOT WEAR CLOTHING THAT HAS BEEN CONTAMINATED with grease or oil.
5. KEEP CABLES DRY AND FREE FROM OIL AND GREASE and never coil around shoulders.
6. SECURE WORK WITH CLAMPS or other means; don't overreach when working.
7. NEVER STRIKE AN ARC ON A COMPRESSED GAS CYLINDER
8. DON'T ALLOW THE INSULATED PORTION OF THE ELECTRODE HOLDER TO TOUCH THE WELDING GROUND WHILE CURRENT IS FLOWING.
9. SHUT OFF POWER AND UNPLUG MACHINE WHEN REPAIRING OR ADJUSTING. Inspect before every use. Only use identical replacement part.
10. FOLLOW ALL MANUFACTURER'S RULES on operating switches and making adjustments.
11. ALWAYS WEAR PROTECTIVE CLOTHING when welding . This includes: long sleeved shirt( leather sleeves), protective apron without pockets, long protective pants and boots. When handling hot materials, wear asbestos gloves.
12. ALWAYS WEAR A WELDER'S HELMET WITH PROTECTIVE EYE PIECE when welding. Arcs may cause blindness. Wear a protective cap underneath the helmet.
13. WHEN WELDING OVERHEAD, BEWARE OF HOT METAL DROPPINGS. Always protect the head, hand, feet and body.
14. KEEP A FIRE EXTINGUISHER CLOSE BY AT ALL TIMES.
15. DO NOT EXCEED THE DUTY CYCLE OF THE MACHINE. The rated cycle of a welding machine is the percentage of a ten minute period that the machine can operate safely at a given output setting.
16. KEEP ALL CHILDREN AWAY FROM WORK AREA. When storing equipment, make sure it is out of reach of children.
17. GUARD AGAINST ELECTRIC SHOCK. DO not work when tired. Do not let body come in' contact with grounded surfaces.

## I. MAIN USAGE AND THE RANGE OF USAGE

WT 315DP/400DP Welder is triple functional machine used as STICK, DC TIG (PULSE TIG) Welder. All ferrous metals copper, titanium and stainless steel material can be omnibearing welding in all position. The welding current is stable and stepless adjustable. The welding seam is nice. few spatter and low noise occurs during welding. The welder is small volume, light in weight and easy to move. It is particularly suitable for enterprise of pressure vessel, building, shipping and petrochemical works. It is the priority product to replace the NSA series welding machine.

## II. MAIN TECHNICAL SPECIFICATIONS

MODEL		WT 315DP	WT 400DP
INPUT	Voltage	3~AC380V 50/60Hz	
	AMP Adjusting Range	10~315A	10~400A
DC	Rated Duty Cycle	60%	
	Current Up-slope Time	0~10S	
	Current Down-slope Time	0~25S	
	pulse(Base/AMP) Current Ratio	5%-95%	
	Pluse Time On	0.1~0.9	
	Pluse Frequency	0.5~25(25~250)Hz	
	TIG	post Flow Time	0~25s
Arc starting Mode		high frequency arc striking	
Pre Flow		0-10s	
Start Amps		10-315A	10-400A
End Amps		10-315A	10-400A
DC STICK	No-load Voltage	80V	
	Current Range	10-250A	10-315A
	Rated Output Current	250A	315A
	Rated Duty Cycle	60%	
Efficiency		≥83%	
Mass		20kg	21kg
Protection Class of enclosure		IP21S	
Outline Dimensions mm <sup>3</sup>		470x235x435	

## III. OPERATING CONDITION AND WORK SURROUNDING

### 1. Operating condition:

Voltage of power source: 3~AC380 V ± 10%. Frequency: 50/60Hz

Reliable grounding protection

## 2. Work surrounding

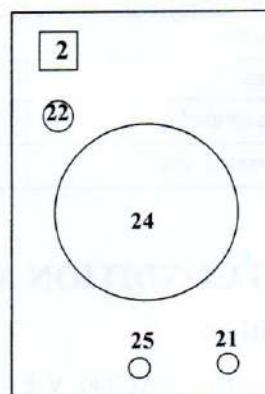
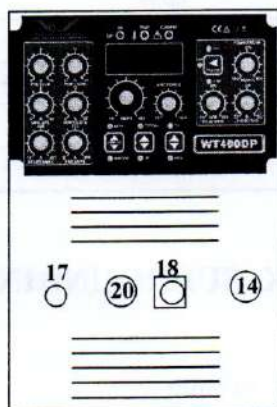
- ①. relative humidity: not more than 90 % (average monthly temperature not more than 20°C)
- ②. ambient temperature: -10°C ~ 40°C
- ③. The welding site should have no harmful gas, Chemicals, molds and inflammable matter, explosive and corrosive medium, no big vibration and bump to the welder.
- ④. Avoiding rain water. Operating in rain is not allowed.

## IV. DESCRIPTION OF THE ERECTION

### 1. Before welding, the operator should read the operation instructions.

2. Check the welder appearance for deformation and damage.
3. For the safety of the equipment and the persons, the customer must correctly make grounding or protection according to the power supply system: using 4mm<sup>2</sup> lead to connect the protection grounding of the welder
4. Welding operation should be carried out in dry and good ventilating area. The surrounding objects should be not less than 0.5m away from the welder.
5. Checking the welder output connector for tightness.
6. The welder can not be moved and the cover can not be opened during the power is on and welding operation is carried out.
7. The welder should be cared, used and managed by specialized person.
8. Current of the distribution board: not less than 40A

## V. SKETCH THE PANEL FUNCTION

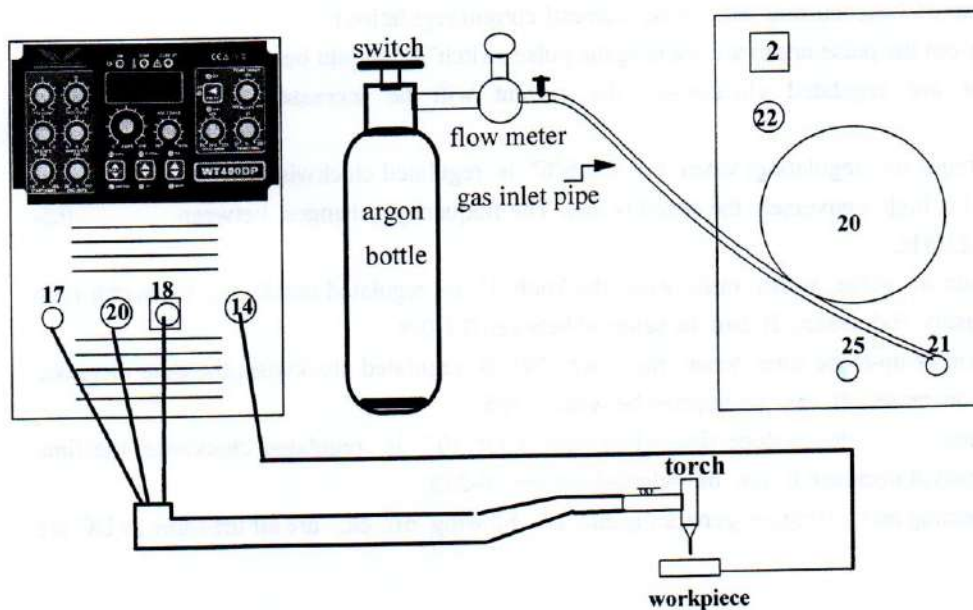




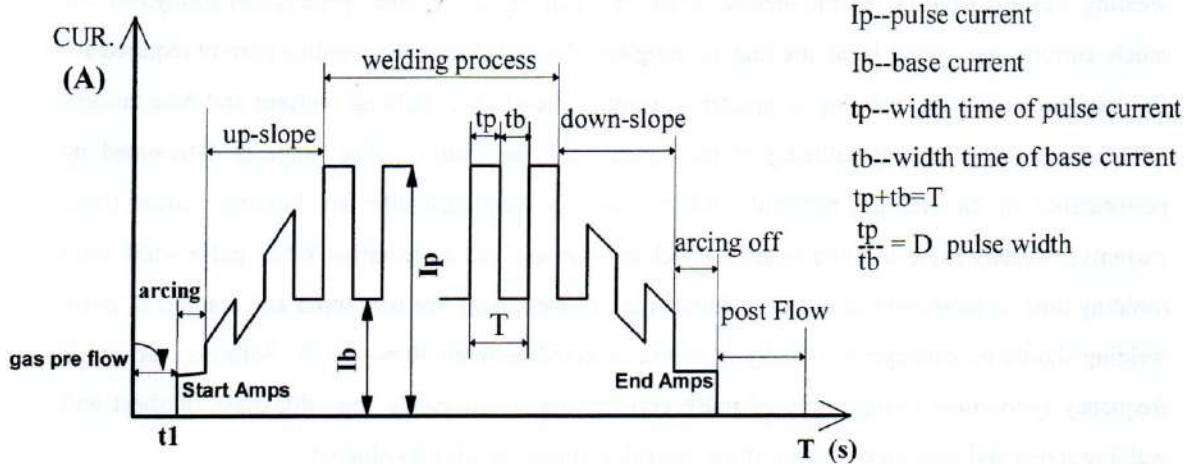
- 1.indication of welding current/Volts. 2.power switch 3.pulse AMP regulator 4.AMP regulator  
 5.Pulse T time On 6.pulse Freq. regulator 7.indicating light of power 8.warning indicating light  
 9. current up-slope time regulator 10.current down-slope time regulator 11.post flow time regulator  
 12.MMA/TIG switch 14.output"+" 16. arc force 17.argon out  
 18.torch control 19. Amp/volt. display switch 20. output"-" 21.argon inlet  
 22.power supply 23.nameplate 24.fan 25.safety earthing column 26. 2 steps/ 4 steps switch  
 28,PreFlow,29.Start Amps,30.End Amps, 31.Pulse On/Off. switch 32.warning indicating light

## VI.METHOD OF THE OPERATION

### 1.ARGON ARC WELDING(TIG)



#### 1.4 PULSE ARGON TUNGSTEN WELDING PROCESS (only for reference)



##### ①. Features and application scope of the process .

The pulse type argon tungsten are welding is different from the continuous(DC) argon are welding. The welding current is pulsed. The wave form of the current is shown in the following sketch.  $I_p$  and  $I_b$  and their continuous time  $t_p$  and  $t_b$  can be regulated according to requirements of the process. The amplitude value of electric current changes periodically with certain frequency in case of the pulse current, molten base will be formed in the workpiece and the molten bath will be solidified in care of base current. The welding seam is formed by reciprocal overlaps. Welding heat input can be controlled by regulating pulse frequency, pulse current amplitude, size of base current, continuous time of pulse current and base current and therefore the welding seam, size and quality of the zone influenced from heat can be controlled.

##### ②. Advantages and application scope of pulse argon gas tungsten arc welding

a. Precisely control the size of the bath inputting heat to workpiece to increase penetration resistance of molten seam and preservation of bath. It is easy to obtain even fusing deepness. This process is specially applicable to omni-bearing welding of sheet and formation to be done with both sides through one side welding.

b. Heating and cooling of each welding point is very fast, Therefore, the process is applicable for the workpiece with great difference of heat conductivity and thickness.

c. Pulse arc can obtain greater fusing deepness with lower heat input. Therefore under the same condition, the zone influenced from welding heat and deformation from welding can be reduced. This is very important for sheet and ultra-thin sheet welding.

d. Fast cooling of the bath metal and shot duration time of high temperature during welding can reduce cracks caused to the thermo-sensitive materials during welding.

##### ③. Selection of welding parameters

Except for pulse current and the width time (width ratio) as well as pulse frequency, welding

parameters of pulse argon gas tungsten arc welding are as same as general tungsten DC argon arc welding. Pulse current increasing means electric arc can obtain greater penetration ability. But too much current can cause local melting of tungsten electrode. Generally, welding current required for DC tungsten argon arc welding or greater current is used. Arc holding current and base current influences cooling and crystallizing of the metal in the bath. The range is determined by performance of the welding materials. When sheet is welding, smaller arc holding current (base current) is usually used in order to reduce welding through and deformation. When pulse width ratio (holding time of pulse current and base current) is selected, both the heat input and features of pulse welding should be considered. Usually, it can be selected between 10% - 90%. Selection of pulse frequency (periodical change time of pulse current) mainly depends on thickness of sheet and welding speed and operation custom of the operator should be also considered.

If you use longer cable tig torch, please set the "Pre Flow" time between 0-10s.

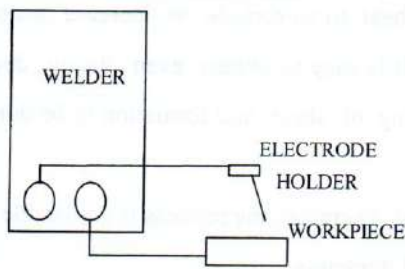
When tig arc start difficult, you can adjusting the "Start amps" for easy arc start.

Please set the "End Amps" according to your workpiece material.

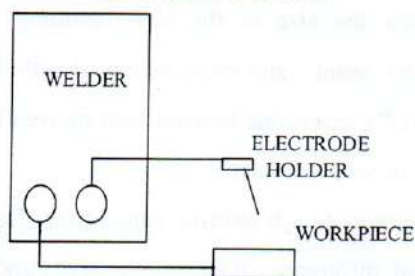
## 2. Hand welding with electrode

- ①. Put switch "12" (MMA/TIG switch) onto the position "MMA".
- ②. Regulating Current Knob "4" (AMP regulator) to select right welding current  
select empiric formula:  $I=40d$ ,  $d$  is dia. of the electrode.
- ③. Notice positive and negative connection during welding.

### A. POSITIVE CONNECTION



### B. NEGATIVE CONNECTION

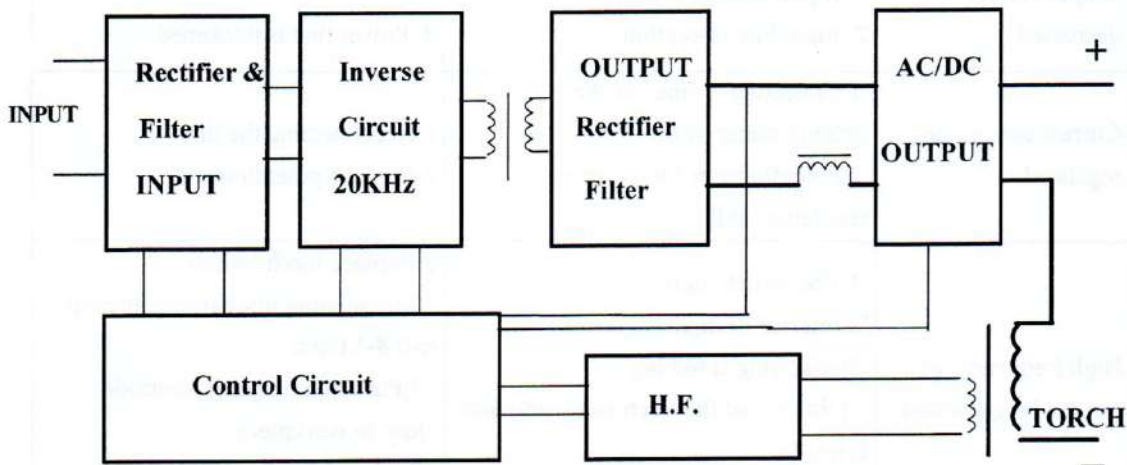


④. Connecting input power for the welder, then switch on the power and current indicating light "7" is on.

⑤. Pay attention to rated welding current and rated duty cycle of the welder. Overload is not allowed.

⑥. After the welding operation is finished, let the welder be ventilated for a few minutes and then cut off the power switch.

## VII.SYSTEMATIC BLOCK DIAGRAM



VIII.This product is sold subject to the understanding that if any defect in manufacture or material shall appear within 12 months from date of consumer sale, the manufacturer will arrange for such defect to be rectified without charge on the sales invoice and warranty card (except for any personal trouble).

### General Troubles and Problem Solving:

Trouble	Causes	Problem Solving
Power lamp not light	1.No electricity input 2.Switch of welder fails.	1.Check incoming line . 2.Replace the switch
Fan not rotating	1.Fan power line is off. 2.Enclosure blocks the fan due to deformation 3.The fan fails.	1.Reconnect the line 2.Reform the enclosure . 3.Replace the fan
Warning lamp lights	1.Over heat(yellow lamp lights) 2.Over current(Green lamp lights)	1.Welding after cooling. 2.Input voltage too low or the machine fails.
No output of welder	1.Over current protection 2. Welder fails	1. Over load using 2. Maintenance in manufacturer or service center



			
<b>WARNING</b>	<ul style="list-style-type: none"> <li>Do not touch electrically live parts or electrode with skin or wet clothing.</li> <li>Insulate yourself from work and ground.</li> </ul>	<ul style="list-style-type: none"> <li>Keep flammable materials away.</li> </ul>	<ul style="list-style-type: none"> <li>Wear eye, ear and body protection.</li> </ul>
Spanish <b>AVISO DE PRECAUCION</b>	<ul style="list-style-type: none"> <li>No toque las partes o los electrodos bajo carga con la piel o ropa mojada.</li> <li>Aíselese del trabajo y de la tierra.</li> </ul>	<ul style="list-style-type: none"> <li>Mantenga el material combustible fuera del área de trabajo.</li> </ul>	<ul style="list-style-type: none"> <li>Protéjase los ojos, los oídos y el cuerpo.</li> </ul>
French <b>ATTENTION</b>	<ul style="list-style-type: none"> <li>Ne laissez ni la peau ni des vêtements mouillés entrer en contact avec des pièces sous tension.</li> <li>Isolez-vous du travail et de la terre.</li> </ul>	<ul style="list-style-type: none"> <li>Gardez à l'écart de tout matériel inflammable.</li> </ul>	<ul style="list-style-type: none"> <li>Protégez vos yeux, vos oreilles et votre corps.</li> </ul>
German <b>WARNUNG</b>	<ul style="list-style-type: none"> <li>Berühren Sie keine stromführenden Teile oder Elektroden mit Ihrem Körper oder feuchter Kleidung!</li> <li>Isolieren Sie sich von den Elektroden und dem Erdboden!</li> </ul>	<ul style="list-style-type: none"> <li>Entfernen Sie brennbares Material!</li> </ul>	<ul style="list-style-type: none"> <li>Tragen Sie Augen-, Ohren- und Körperschutz!</li> </ul>
Portuguese <b>ATENÇÃO</b>	<ul style="list-style-type: none"> <li>Não toque partes elétricas e electrodos com a pele ou roupa molhada.</li> <li>Isole-se da peça e terra.</li> </ul>	<ul style="list-style-type: none"> <li>Mantenha inflamáveis bem guardados.</li> </ul>	<ul style="list-style-type: none"> <li>Use proteção para a vista, ouvido e corpo.</li> </ul>
Japanese <b>注意事項</b>	<ul style="list-style-type: none"> <li>通電中の電気部品、又は溶材にヒフやぬれた布で触れないこと。</li> <li>施工物やアースから身体が絶縁されている様にして下さい。</li> </ul>	<ul style="list-style-type: none"> <li>燃えやすいものの側での溶接作業は絶対にはなりません。</li> </ul>	<ul style="list-style-type: none"> <li>目、耳及び身体に保護具をして下さい。</li> </ul>
Chinese <b>警告</b>	<ul style="list-style-type: none"> <li>皮肤或湿衣物切勿接触带电部件及焊缝。</li> <li>使你自已與地面和工件絕緣。</li> </ul>	<ul style="list-style-type: none"> <li>把一切易燃物品移離工作場所。</li> </ul>	<ul style="list-style-type: none"> <li>佩戴眼、耳及身體勞動保護用具。</li> </ul>
Korean <b>위험</b>	<ul style="list-style-type: none"> <li>집도체나 용접봉을 젖은 황갑 또는 피부로 절대 접촉치 마십시오.</li> <li>모재와 집지를 접촉치 마십시오.</li> </ul>	<ul style="list-style-type: none"> <li>인화성 물질을 접근시키지 마십시오.</li> </ul>	<ul style="list-style-type: none"> <li>눈, 귀와 몸에 보호장구를 착용하십시오.</li> </ul>
Arabic <b>تحذير</b>	<ul style="list-style-type: none"> <li>لا تلمس الأجزاء التي يمر بها التيار الكهربائي أو الألكترود بجلد الجسم أو الملابس المبللة بالماء.</li> <li>ضع عازلا على جسمك خلال العمل.</li> </ul>	<ul style="list-style-type: none"> <li>ضع المواد القابلة للاشتعال في مكان بعيد.</li> </ul>	<ul style="list-style-type: none"> <li>ضع أدوات وملابس واقية على عينيك وأذنيك وجسمك.</li> </ul>

READ AND UNDERSTAND THE MANUFACTURER'S INSTRUCTION FOR THIS EQUIPMENT AND THE CONSUMABLES TO BE USED AND FOLLOW YOUR EMPLOYER'S SAFETY PRACTICES.

SE RECOMIENDA LEER Y ENTENDER LAS INSTRUCCIONES DEL FABRICANTE PARA EL USO DE ESTE EQUIPO Y LOS CONSUMIBLES QUE VA A UTILIZAR, SIGA LAS MEDIDAS DE SEGURIDAD DE SU SUPERVISOR.

LISEZ ET COMPRENEZ LES INSTRUCTIONS DU FABRICANT EN CE QUI REGARDE CET EQUIPMENT ET LES PRODUITS A ETRE EMPLOYES ET SUIVEZ LES PROCEDURES DE SECURITE DE VOTRE EMPLOYEUR.

LESEN SIE UND BEFOLGEN SIE DIE BETRIEBSANLEITUNG DER ANLAGE UND DEN ELEKTRODENEINSATZ DES HERSTELLERS. DIE UNFALLVERHÜTUNGSVORSCHRIFTEN DES ARBEITGEBERS SIND EBENFALLS ZU BEACHTEN.