

MANUAL BOOK

SUPERTIG315EX AC/DC TIG/ PULSE TIG WELDING MACHINE



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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 DESIGEND. 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 handing 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

SUPERTIG315EX Welder is triple functional machine used as MMA , AC TIG, DC TIG (PULSE TIG)Welder. All ferrous metals copper, Aluminium ,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		SUPERTIG315EX	
INPUT	Voltage	3 ~AC380V 50/60Hz	
	No-load Voltage	80V	
	Welding current Adjusting Range	20~315A	
	AC balance	10%~90 %	
AC	AC Square Wave Frequency	20~250Hz	
TIG	Rated Duty Cycle	35%	
	Pre Flow	0-10s	
	Spot time	0-10s	
	Post Flow Time	0~25s	
	Current Adjusting Range	10~315A	
	Rated Duty Cycle	35%	
DC	Current Up-slope Time	0 ~ 10S	
DC	Current Down-slope Time	0 ~ 25S	
	pulse (Base)Current	10-315A	
	Pluse Time On	0.1~0.9	
TIG	Pluse Frequency	0.2~25(25~250)Hz	
HG	Post Flow Time	0~25s	
	Arc starting Mode	high frequency arc striking/Lift	
	Pre Flow	0-10s	
	No-load Voltage	80V	
DC	Current Range	20-250A	
MMA	Rated Output Current	250A	
	Rated Duty Cycle	35%	
	Efficiency	≥83%	
	Mass	36kg	
F	Protection Class of enclosure	IP21S	
·	Outline Dimensions mm ³	470x235x435	

III. OPERATING CONDITION AND WORK SURROUNDING

1. Operating condition:

Voltage of power source: $3 \sim 380 \text{V} \pm 10\%$. Frequency: 50/60 Hz

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.

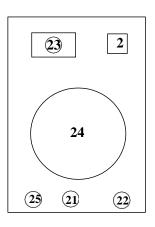
IV. DESCRIPTION OF THE ERECTION

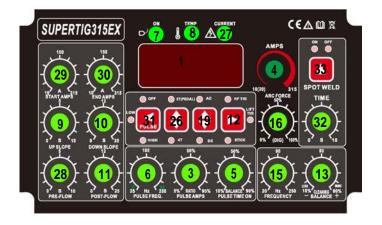
1. Before welding, the operator should read the operation instructions.

- 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 4mm² 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 SKETCH THE PANEL FUNCTION



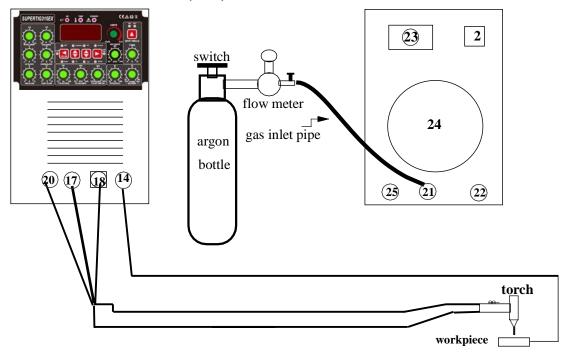




1.indication of welding current 2.power switch 3.pulse (base) current regulator 4.current regulator 5.Pulse time On 6.pulse Freq. regulator 7.indicating light of power 8.O.T. indicating light 9. current up-slope time regulator10.current down-slope time regulator 11. post flow time regulator 12.STICK/TIG/switch 13.AC balance 14.output"+"15.AC square wave Frequency 16. arc force 17.argon out 18.argon arc control 19. AC/DC TIG switch 20. output"-" 21.argon inlet 22.power supply 23.nameplate 24.fan 25.safety earthing column 26. 2 steps/4 steps switch 27. Warning indicating light 28,PreFlow,29.Start Amps,30.End Amps, 31.Pulse On/Off.32.Spot time regulator 33 spot switch

VI.METHOD OF THE OPERATION

1.ARGON ARC WELDING(TIG)



1.1 CLEARING BEFORE WELDING

Tungsten argon an welding is very sensitive to surface contamination of filled metal. Therefore before welding is carried out, grease, paint and coating on the surface, lubricant for machining and oxidized film should be removed.

1.2 DC ARGON ARC WELDING

When you need process at DC tig, please switch "pulse off/low/high" to "pulse off".

- ①.Put Switch "19"(AC/DC) onto the position "DC", Connecting the gas inlet pipe to inlet "21" of the welding. Put switch "12" (MMA/TIG switch) onto the position "TIG".
 - 2. Connecting gas inlet pipe of the welding torch to argon output of welder "17".
 - ③.Putting the aerial plug of the welding torch in the argon arc control socket "18".
 - ④. Testing gas: get the power of the welder ready and switch on the power "2", open the argon bottle switch and switch on the flow meter, press the torch switch, select suitable argon flow.
- ⑤. .Regulating the base current knob "4"(pulse switch "OFF") . Selecting suitable welding current according to thickness of the workpiece to be welded.. Selecting suitable current down slope time and after flow time according to the current.

Notice 1: The current indicating meter on the front panel is used to display the preset output current level before welding, and actual output level while welding: A lit display indicates input power is turned on.

⑥. Tungsten electrode end is 2-3mm away from the welding workpiece. Press the torch switch, arc striking will occur.

Notice: During welding, when the 26. 2steps/4steps switch or 2 steps, switch of the torch be pressed and can not be released.otherwise the arc will be broken.

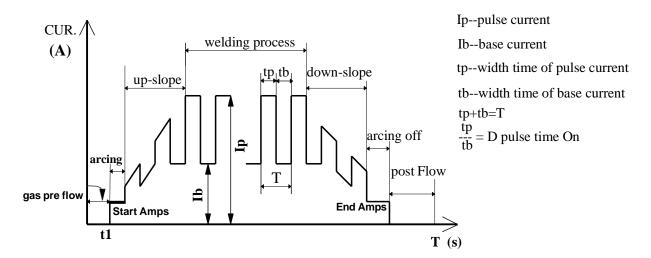
- ⑦.Releasing the switch of the torch, welding current will reduce gradually (time is adjustive) and arc extinguishes. The welding torch can not be removed as soon as the arc extinguishing. Let the protection gas cooling down for the welding seam not to be oxidized.
- 8. When the welding operation is finished, turn off argon bottle switch and cut off input power of the welder.

1.3 PULSE ARGON ARC WELDING

- ①. Selection of base current and pulse current(current regulation): pulse switch "low " or "high"
- ②. Pulse frequency regulating: when the knob"6" is regulated clockwise, the frequency is high and pulse speed is high; conversely the speed is low. The frequency changes between 0.5-25Hz(when the Pulse Off/low/pulse high at low position). when you put the switch to "pulse high", the pulse frequency range up to 25-250Hz.
- ③.Regulation of pulse width ratio; when the knob"5" is regulated clockwise, the width ratio increase, conversely, it decrease. It can be selected between 0.1-0.9.
- ④.Regulation of up-slope time: when the knob "9" is regulated clockwise, the time increase, conversely, it decrease. It can be selected between 0-105S.
- ⑤ .Regulation of down-slope time:when the knob"10" is regulated clockwise, the time increase,conversely,it decrease.It can be selected between 0-10S.

⑥.Gas connecting and testing, are generating and are blowing off etc. are all the same as DC are welding.

1.4 PULSE ARGON TUNGSTEN WEIDING 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. Ip and Ib and their continuous time tp and tb 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 (Pulse time On) as well as pulse frequency ,welding parameters of pulse argon gas tungsten arc welding are as same as general tungsten DC argon are 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 are 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.

1.5 AC ARGON ARC WELDING

- 1. put switch "19" (AC/DC) onto the position "AC".
- 2. The method of the connection same as 1.1
- 3. Reguting "13" to select right "sp(AC balance)"

$$SP = \frac{tp}{tn} *100\%$$

tp:the time of I_2 at positive tn: the time of In at Negative

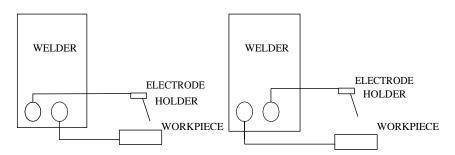
- 4. Regulating "15" to select right AC square wave frequency.
- **5.** The Method of the welding same **as 1.1**

2. Hand welding with electrode

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

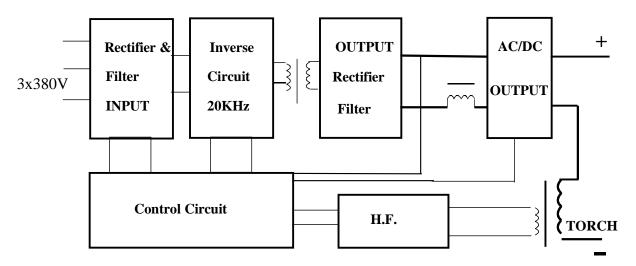
A. POSITIVE CONNECTION

B. NEGATIVE CONNECTION



- ①.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



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)	Nelding after cooling. Input voltage too low or the machine fails.	
No output of welder	Over current protection Welder fails	Over load using Maintenance in manufacturer or service center	
Output current decreased	Input Voltage is low Input line is too thin	2. Power line is thickened	
Current can not be regulated	Cnnecting line of the potentiomet er is off Potentiometer for current regulation fails	1.Reconnecting the line 2.Replace potentiometer	
High frequency are can not be generated	1. The switch fails 2. Interval of high frequency discharging is too big 3. Distance of the torch and workpiece is too far 4. High frequency arc generator fails	1.Replace torch switch 2.Regulating discharging interval to 0.8-1.0mm 3. Put torch tungsten electrode close to workpiece 4. Replace high frequency arc generator	
Arc of argon welding is broken or tungsten electrode is burn	1Argon gas flow is not regulated well 2.Tungsten electrode fails 3. Value of current does not match wit h dia. of tungsten electrode 4. After flow time too short	1.Regulated well 2.Replace or sharpen 3. Select the electrode dia. and current correctly 4. Enlarge the time	
Welding torch overheat	Not use the water cooling when the current is more than 160A The argon flow is the low current	1.Use water cooling 2.Enlarge the argon flow	
Welding stops, and warning light is on	Self-protection has engaged 1.Display "E01" 2.Display "E02" 3.Display "E03"(no use) 4.Display "E04"(no use) 5.Display "E05" 6.Display "E06"(no use) 7.Display "E07"(no use)	1. over-temperature(over hot), 2. over-current, 3. over-voltage, lower-voltage(input) 4. Lack of water or Lack of water flow 5. HF problem or press hand switch and never get arc more than 2s 6. low air pressure (lower than 0.2 Mpa) 7. ABS. phase	

IX .ACCESSORIES:SEE PACKING LIST,PLEASE

PACKING LIST



SUPERTIG315EX	1	
Ground clamp	1	
TIG welding torch	1	
Welding holder	1	
gas inlet pipe	1	
Operation instructions	1	
Certificate of quality	1	

No.	
	Certificate of quality

Name of product: AC	TIG/DCTIG/DC STICK MACHINE			
Type of product: SI	UPERTIG315EX			
Packing No:				
Test results of this welder fulfils				
technical	requirements and its release			
from the works is gra	inted.			
Inspector	Date			

WARNING	 Do not touch electrically live parts or electrode with skin or wet clothing. Insulate yourself from work and ground. 	Keep flammable materials away.	Wear eye, ear and body protection.
AVISO DE PRECAUCION	 No toque las partes o los electrodos bajo carga con la piel o ropa moja- da. Aislese del trabajo y de la tierra. 	 Mantenga el material combustible fuera del área de trabajo. 	Protéjase los ojos, los oídos y el cuerpo.
ATTENTION	Ne laissez ni la peau ni des vête- ments mouillés entrer en contact avec des pièces sous tension. Isolez-vous du travail et de la terre.	Gardez à l'écart de tout matériel inflammable.	Protégez vos yeux, vos oreilles et votre corps.
WARNUNG	 Berühren Sie keine stromführenden Teile oder Elektroden mit Ihrem Körper oder feuchter Kleidung! Isolieren Sie sich von den Elektroden und dem Erdboden! 	Entfernen Sie brennbarres Material!	Tragen Sie Augen-, Ohren- und Kör- perschutz!
ATENÇÃO	 Não toque partes elétricas e electrodos com a pele ou roupa molhada. Isole-se da peua e terra. 	Mantenha inflamáveis bem guardados.	Use proteuão para a vista, ouvido e corpo.
注意事項	●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。●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。	● 燃えやすいものの側での溶接作業は絶対にしてはなりません。	● 目、耳及び身体に保護具をして下 さい。
Chinese 整 生	● 皮肤或濕衣物切勿接觸帶電部件及 銲條。● 使你自己與地面和工件絶縁。	●把一切易燃物品移離工作場所。	● 係 戴 眼、耳及身體勞動保護用具。
위 함	● 전도체나 용접봉을 젖은 형겁 또는 피부로 절대 접촉치 마십시요. ● 모재와 접지를 접촉치 마십시요.	●인화성 물질을 접근 시키지 마시요.	● 눈, 귀와 몸에 보호장구를 착용하십시요.
Arabic تحذیر	 ♦ لا تلمس الاجزاء التي يسري فيها التيار الكهرباني أو الاكترود بجلد الجسم أو بالملابس المبللة بالماء. ♦ ضع عاز لا على جسمك خلال العمل. 	 ضع المواد القابلة للاشتعال في مكان بعيد. 	● ضع أدوات وملابس واقية على عينيك وأذنيك وخسمك.

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.

	7		
Keep your head out of fumes. Use ventilation or exhaust to remove fumes from breathing zone.	Turn power off before servicing.	Do not operate with panel open or guards off.	WARNING
 Los humos fuera de la zona de respiración. Mantenga la cabeza fuera de los humos. Utilice ventilación o aspiración para gases. 	Desconectar el cable de ali- mentación de poder de la máquina antes de iniciar cualquier servicio.	No operar con panel abierto o guardas quitadas.	AVISO DE PRECAUCION
 Gardez la tête à l'écart des fumées. Utilisez un ventilateur ou un aspirateur pour ôter les fumées des zones de travail. 	Débranchez le courant avant l'entre- tien.	 N'opérez pas avec les panneaux ouverts ou avec les dispositifs de protection enlevés. 	ATTENTION
 Vermeiden Sie das Einatmen von Schweibrauch! Sorgen Sie für gute Be- und Entlüftung des Arbeitsplatzes! 	Strom vor Wartungsarbeiten abschalten! (Netzstrom völlig öff- nen; Maschine anhalten!)	Anlage nie ohne Schutzgehäuse oder Innenschutzverkleidung in Betrieb setzen!	WARNUNG
 Mantenha seu rosto da fuma qa. Use ventila qão e exhaustão para remover fumo da zona respiratória. 	 Não opere com as tampas removidas. Desligue a corrente antes de fazer serviuo. Não toque as partes elétricas nuas. 	 Mantenha-se afastado das partes moventes. Não opere com os paineis abertos ou guardas removidas. 	ATENÇÃO
ヒュームから頭を離すようにして下さい。換気や排煙に十分留意して下さい。	■ メンテナンス・サービスに取りかかる際には、まず電源スイッチを必ず切って下さい。	● パネルやカバーを取り外したままで機械操作をしないで下さい。	注意事項
●頭部遠離煙霧。 ●在呼吸區使用通風或排風器除煙。	●維修前切斷電源。	● 儀表板打開或沒有安全罩時不準作 業。	Chinese
● 얼굴로부터 용접가스를 멀리하십시요. ● 호흡지역으로부터 용접가스를 제거하기 위해 가스제거기나 통풍기를 사용하십시요.	● 보수전에 전원을 차단하십시요.	● 판넬이 열린 상태로 작동치 마십시요.	Rorean 위 험
 ابعد رأسك بعيداً عن الدخان. استعمل التهوية أو جهاز ضغط الدخان للخارج لكى تبعد الدخان عن المنطقة التي تتنفس فيها. 	 ● اقطع التيار الكهرباني قبل القيام بأية صيانة. 	 ♦ لا تشغل هذا الجهاز اذا كانت الاغطية الحديدية الواقية ليست عليه. 	Arabic Landing

LEIA E COMPREENDA AS INSTRUÇÕES DO FABRICANTE PARA ESTE EQUIPAMENTO E AS PARTES DE USO, E SIGA AS PRÁTICAS DE SEGURANÇA DO EMPREGADOR.

使う機械や溶材のメーカーの指示書をよく読み、まず理解して下さい。そして貴社の安全規定に従って下さい。

請詳細閱讀並理解製造廠提供的説明以及應該使用的銀捍材料,並請遵守貴方的有関勞動保護規定。

이 제폼에 동봉된 작업지침서를 숙지하시고 귀사의 작업자 안전수칙을 준수하시기 바랍니다.

اقرأ بتمعن وافهم تعليمات المصنع المنتج لهذه المعدات والمواد قبل استعمالها واتبع تعليمات الوقاية لصاحب العمل.