Product User Manual

Digital Double Pulse Gas-shielded Welding Machine

B.TECH® TOOLS
An Experience of Tools

MODEL NO:0500355

As the user's manual of digital MIG series inverter welding machine, this Manual is only for the MIG series welder. No prior notice will be given in case of any change.

In the benefit of you and others, we recommend you to read and fully understand this Manual before installation andoperation.

Wave System 5

Safety instructions

Note	Please install and use strictly according to the Manual! Electrical connection can be done only after the power of the distribution box is turned off. The operation process shall conform to relevant safety operation rules.		
	Warning An electric shock may hurt or even kill people. Please turn off the power of the distribution box before wiring. Do not touch exposed conductive parts.		Welding operation may cause fire or explosion! Welding spatter may ignite combustibles nearby. Combustibles shall be placed at least 10m from the welding site. Prevent the spatter from falling on clothes or body.
	The welding fume is harmful to health. Do not inhale the fume produced during welding. Clean up the greasy dirt on work piece. Keep the welding site in ventilation. Smoke and dust exhausting facility shall be arranged at the welding station.		The arc light may hurt the eyes and the skin. Strong arc light may hurt the eyes. The ultraviolet rays produced by the electric arc may hurt the skin and the eyes, and please wear labor protection clothes properly during welding.
	Inert gases are harmful to the human body Inert gases are harmful to the human body and even cause suffocation, so please choose a well-ventilated environment for welding. If not, please close the gas cylinder valve.		High-frequency arc ignition may cause electromagnetic radiation Radiation may interfere with other devices! Contact arc ignition can be used to avoid interference.
	The overheated part may burn the skin, and do not touch the overheated welding part. The overheated part may burn the skin, and do not touch the overheated welding part.		High-speed moving objects may cause hurt. and do not put your hands or a thin objects into the fan hood. Please cover the open shell during welding.
	The gas cylinder may explode. so do not to heat it. It is preferred to keep the gas cylinder away from the welding site and fix it well.		Personal protection. To prevent eye and skin injury, please comply with the rules of labor safety and health and wear necessary protective clothing!

Contents

1 Characteristics of digital double pulse gas-shielded welding machine

Thank you for buying the digital inverter welding machine . Please read the Manual carefully before use. This Manual is applicable to the following welding machine: 0500355

0500355 digital double pulse welding machines apply to welding methods including MMA, MIG/MIX, PULSE AlMg, PULSE AlSi and DOUBLE PULSE.-MIG series welding machines are suitable for welding materials including carbon steel, stainless steel, aluminum-magnesium, aluminum-silicon and flux-cored wire. Its characteristics include no-spatter, uniform weld pool, etc.

The performance features are as follows:

- Use full-digital control system to realize precise control and stable arc length during welding.
- Use full-digital wire feeding control system to realize precise and stable wire feeding.
- With built-in welding expert database, the system can be used to realize automatic intelligent parameter combination.
- Friendly operation interface, unified regulating mode, easy to master.
- Perfect single pulse and double pulse functions, minimum welding spatter and good-looking appearance of weld.
- The special four-step function is suitable for welding metals with good thermal conductivity, and the welding quality is perfect during the arc initiating and extinguishing.

The manufacturing of this series welding machines conforms to the GB15579.1-2013 Arc Welding Equipment - Part 1: Welding Power Source

02

Precautions for electromagnetic compatibility

2-1 Overview

Welding may cause electromagnetic interference.

The interference emission of the arc welding equipment can be minimized by proper installation and proper use.

The product described in this Manual is a Class A equipment (applicable to all occasions other than residential areas powered by public low voltage power systems).

Warning: Class A equipment are not applicable to residential buildings powered by public low voltage power systems. Due to conduction and radiation disturbance, it is difficult to guarantee electromagnetic compatibility in these places.

2-2 Environmental assessment and recommendations

Before installing the arc welding equipment, the user shall evaluate the potential electromagnetic disturbance within the surrounding environment. Considerations are as follows:

- If there are any power cables, control cables, signal and telephone line on or under or around the arc welding equipment;
- If there are radio and television transmitting and receiving equipment;
- If there are computers and other control equipment;
- If there are equipment of high-level of security, such as industrial protective equipment;
- It needs to consider the health of the staff working around, to see if there are individuals wearing hearing -aid and using cardiac pacemaker;
- If there are equipment for calibration or testing;
- Pay attention to the interference immunity of other surrounding equipment. The user shall ensure that other devices used around are compatible, and this may need additional protective measures;
- The time for welding or other activities.

The scope of environment to be considered depends on the structure of the building and other possible activities. This scope may exceed the boundary of the building itself.

2-3 Method to reduce emission

- Public power supply system

  The arc welding equipment shall be connected to the public power supply system in the manner recommended by the manufacturer. If interference occurs, additional preventive measures shall be taken, for example, to add a filter in the public power supply system. For stationary-mounted arc welding equipment, it is necessary to consider the shielding problem of its power supply cable (metal tubes or other equivalent methods can be used for shielding). The shielding shall guarantee electrical continuity. The shielding layer shall also be connected to the housing of welding power toguarantee good electrical contact between them.

- Maintenance of arc welding equipment

  Routine maintenance of the arc welding equipment shall be done in the manner recommended by the manufacturer. When the welding equipment is running, all the inlets, auxiliary openings and cover plates on the equipment shall be closed and properly tightened. The arc welding equipment shall not be modified in any form unless the corresponding changes and adjustments are allowed in the Manual. Especially, the spark gap of the arc-initiating device and arc stabilizer shall be adjusted

- Welding cable

  The welding cable shall be as short as possible and close to each other, close to or close to the floor line.

- Equipotential overlap

  It is necessary to pay attention to the overlapping of all metal objects in the surrounding environment. Overlap of metal object with work piece will increase the risk of work. When operators touch metal object and electrodes at the same time, they may be struck by electric shocks. Operators shall be insulated from all these metal objects.

- Ground of workpiece

  Considering the electrical safety or the position and size of workpiece, the workpiece, such as the hull or the building steel frame, may not be grounded. The connection between the workpiece and the ground may, but not always, reduce the emission. Therefore, it is necessary to prevent the increase of electrical shock or damage of other electrical equipment caused by the grounding of the workpiece. When necessary, the workpiece shall be connected to the ground directly. However, in some countries, direct grounding is not allowed, it can only be realized with appropriate capacitance according to the provisions of the country.

- Shielding

  To shield the surrounding equipment and other cables selectively can reduce the electromagnetic interference. For special applications, it can be considered to shield the whole welding area.

03

Installation of welding machine

3-1 Installation environment

- It shall be placed in indoor environment with no direct sunlight, no rain, low humidity, less dust and ambient air temperature varying from -10°C to +40°C.
- The ground inclination shall not exceed 15°.
- No wind is allowed at the welding station, if any, shield is needed.
- It shall be confirmed that a space at least 20cm shall be kept in front of and behind the welding machine to guarantee good air cooling circulation, and there shall be a space at least 10cm at the right and left side of the welding machine.
- When using water-cooled welding torch, inject pure water into the water-cooling machine and pay attention to freeze protection.

3-2 Quality of power supply voltage

- The waveform shall be standard sine wave, the effective value is 220V±10%(PMIG-250) and 380V±10%(PMIG-315) .the frequ-ency is 50Hz/60Hz.
- The unbalance degree of three-phase voltage =5%
- Technical parameter of power supply

3-3 Basic parameters

Specification of welding machine	0500355
Rated input voltage	380V±10%
Rated input current (A)	MIG:31A MMA:34A TIG:24A
Output no-load voltage (V)	70V
Rated load succession rate	30%
Power factor COSφ	0.73
Efficiency η	85%
Outline dimension (mm)	87*41*63
Net weight (kg)	40

Coating manual welding parameters(MMA Mode)

Specification of welding machine	0500355
Rated input current (A)	20-350A
Arc-initiating (A)	0-100
Arc Force(A)	0-100
VRD	ON/OFF

Unitary gas shielded arc welding parameters(SYNC MIG)

Specification of welding machine	0500355
Rated input current (A)	40～350A
Material selection	CS(CO_2),CS(82%Ar+18%CO_2),FLUX
Welding wire diameter (DIAM)	0.8，0.9,1.0
Operation mode (TRIG)	2T，4T,spot
Inductance (Forc)	-50%～50%
Voltage trimming	-50%～50%
Preflow time of gas (Freg)	0.1
Postflow time of gas (Post)	1s

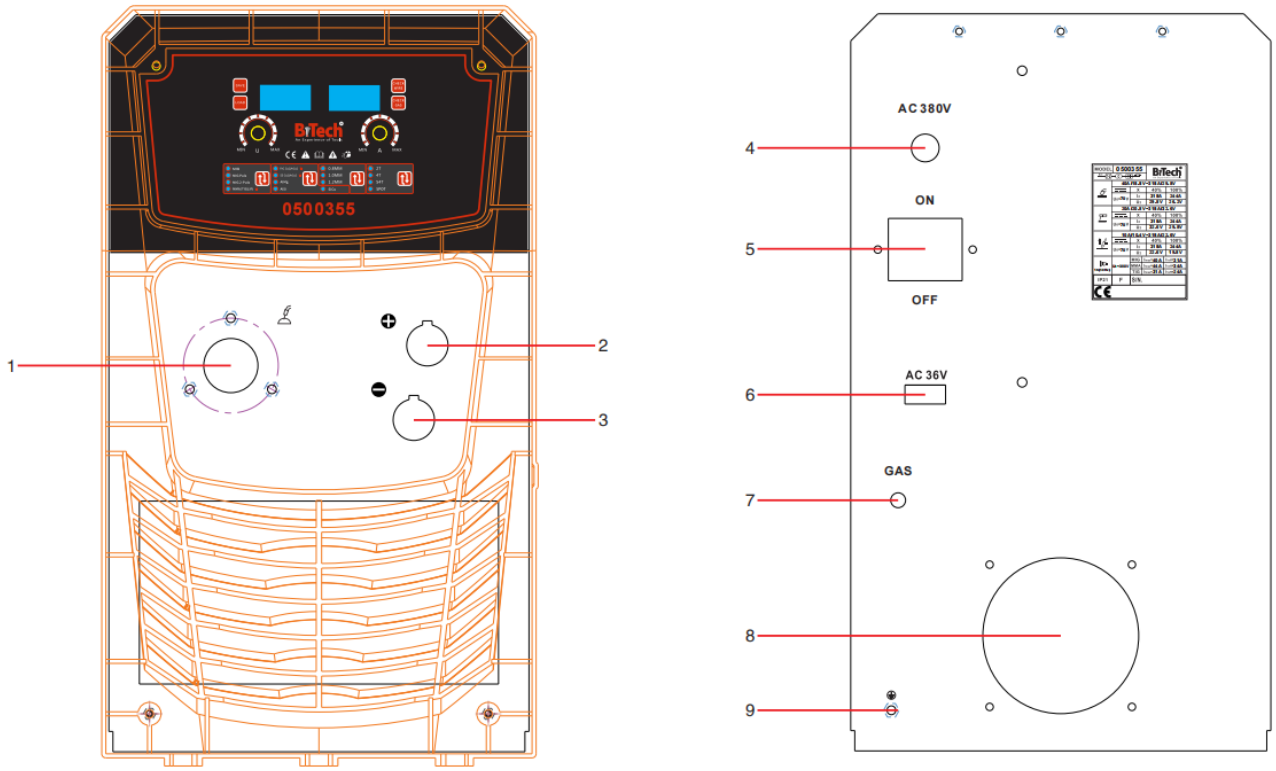
Double pulse gas shielded arc welding(Twin Pulse)

Specification of welding machine	0500355
Rated current (A)	24～350A
Material selection	AlSi(Ar) ,AlMg(Ar),CuSi(Ar),CS(82%Ar+18%CO_2),SS(98%Ar+2%CO_2)
Welding wire diameter (DIAM)	0.8,1.0，1.2
Operation mode (TRIG)	2T，4T， SPOT
Inductance (Forc)	-50%～50%(Normally 0)
Voltage trimming	50%～50%
Pulse frequency (Freq)	0.5～5Hz(Normally 1.5Hz)
Duty ratio (Duty)	20%～80%(Normally 50%)
Basic Current (BA)	30%～85%(Normally 50%)
Peak Current (PA)	1.5-17.5(Normally 4.2)
Preflow time of gas (Freg)	0.1s
Postflow time of gas (Post)	1s

Single pulse gas shielded arc welding(Pulse MIG)

Note: Some of the parameters in the table above can only be used in specific functions.

The controls and interfaces on front and rear panels of welding machine are shown as below



1: European connector for MIG torch:
2: Positive output
3: Negative output
4: Input voltage/Power cable
5: ON/OFF Power switch
6: Output interface for connecting with CO2 regulator
7: GAS interface
8: FAN
9: Earthing Mark

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4-1 Guidance for device connection

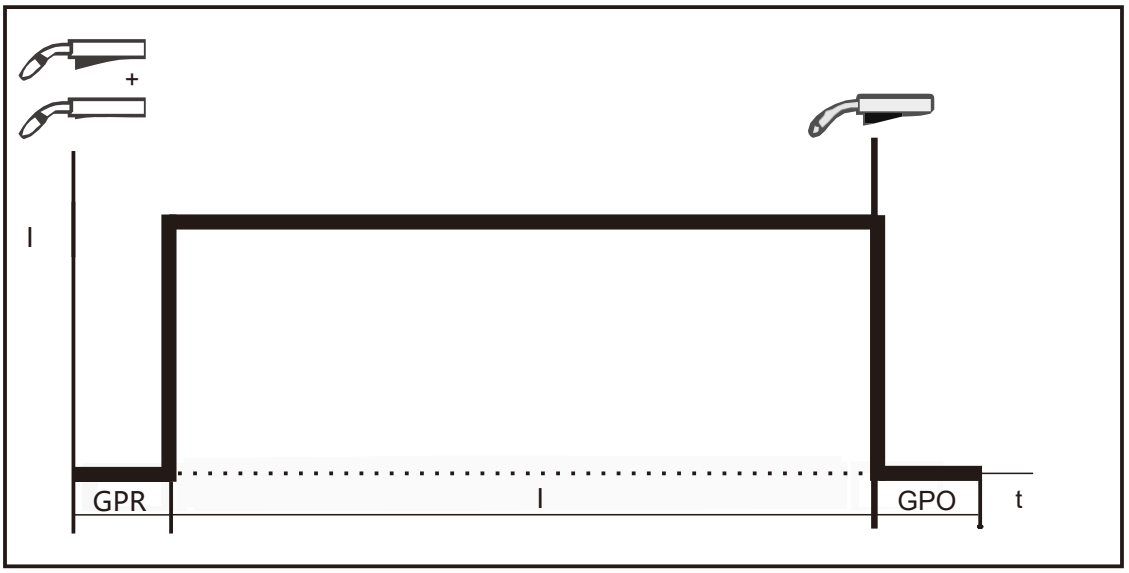
- Use grounding cable to connect the to-be-weld workpiece to the output socket (I) of welding machine.
- Use positive welding cable to connect welding cable socket of wire feeder to the output socket (+) of welding machine.
- Use gas pipe to connect wire feeder to gas regulator or proportioner.
- The heating cable of CO_2 regulator shall be connected to the heating power socket on the rear panel of welding machine.
- Connect the input three-phase cable to the distribution board and the ground wire shall be grounded reliably.
- Close the automatic air switch on the distribution box.

  After the completion of the above work, install the accessories of the supporting wire feeding system and load the wire. Select corresponding weir diameter and material on the control panel of the welding machine and switch in the specified protective gas for the wire material. Turn the voltage knob to the standard position, turn the current knob to obtain the required current, and then you can get the appropriate welding specification and start welding.

  For detailed functions and operations, please see relevant sections of this Manual.

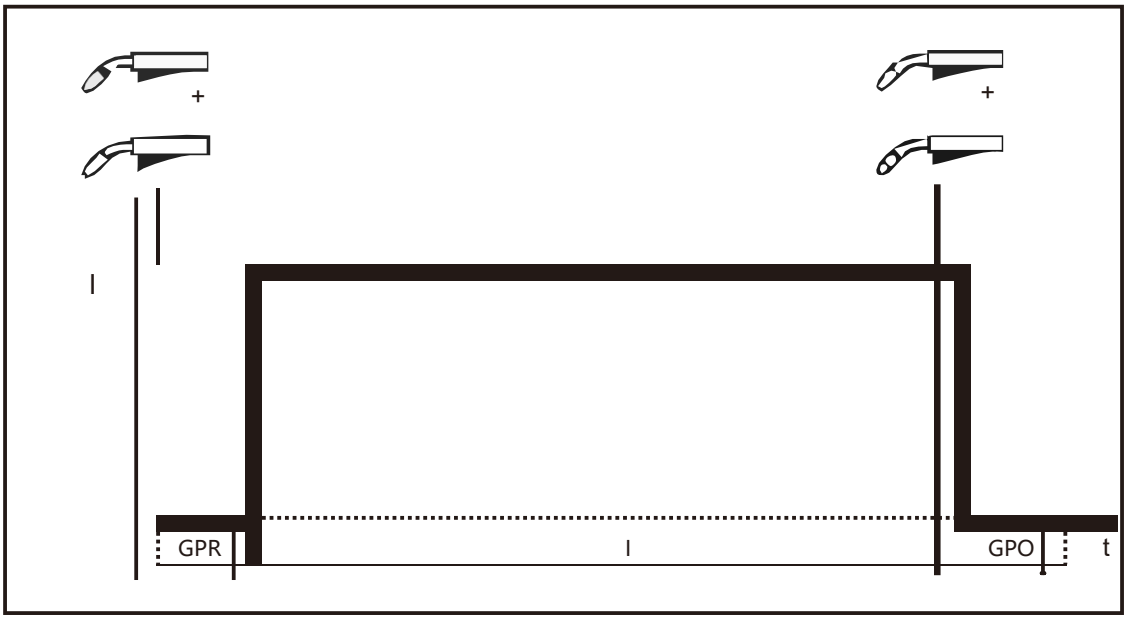
Code	Abbreviation	Name of welding mode
CS	FeCO2	Carbon steel Co_2
CS(1-pulse or 2-pulse)	CS(82%Ar+12%CO2)	Carbon steel Ar 82%+CO_2 18%
AlMg Ar	AlMg 100%Ar	Aluminum-magnesium welding wire (ER 5356) Ar
AlSi Ar	AlSi 100%Ar	Aluminium-silicon welding wire (ER 4043) Ar
CuSi Ar	CuSi 100%Ar	Silicon-bronze welding wire Ar
SS	SS(98%Ar+2%CO2)	Stainless steel welding wire (ER 308/316) Ar 98%+CO_2 2%
Flux(MIG)	flux cored wire	flux-cored wire ,no gas

2T operating instructions: Press the gun switch to start gas supply, wait for the gas preflow time before arcing to the set current, release the gun switch for arc extinguishing and gas postflow.



2TOperation Mode

4T operating instructions: Press (and release) the gun switch to start gas supply, wait for the gas preflow time before arcing to the set current. Press the gun switch once again for arc extingui- shing and gas postflow.

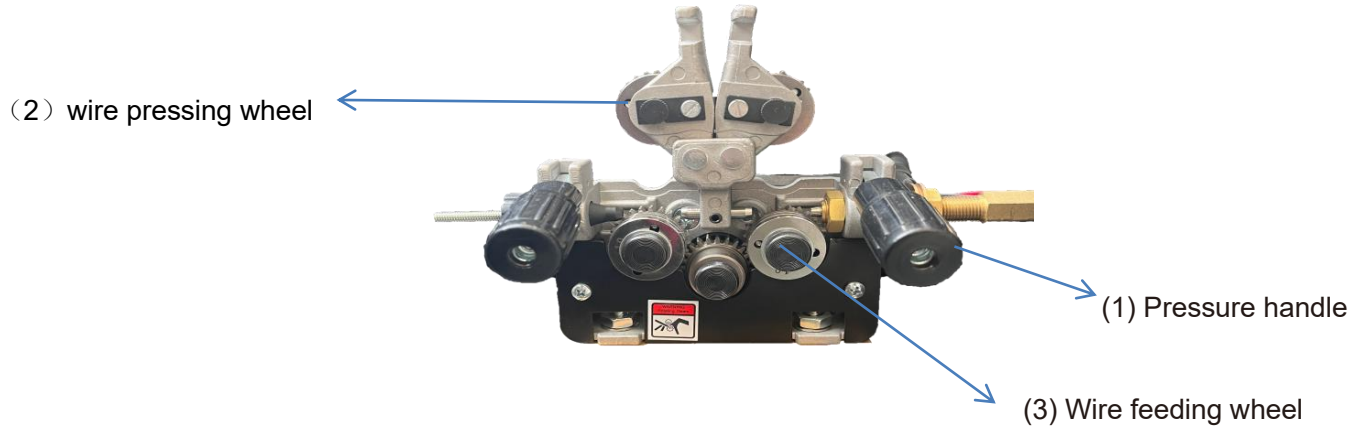


4TOperation Mod

Wire feeder

5-1 Wire feeder mechanism

The wire feeder mechanism is single -drive, as shown in the figure below.



5-2 Specification and installation of wire feeding wheel

The wire feeding pressure scale is located on the pressure handle, and the pressure relations are different for welding wires made of different materials and with different diameters, as shown in the Table 6-2 and Figure 6-2. The values in the table are for reference only, and the actual pressure adjustment specifications must be adjusted according to the welding torch cable length, welding torch type, wire feeding condition and welding wire type.

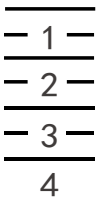
- Type 1 is suitable for the hard welding wire, such as those made of solid cored carbon steel and stainless steel.
- Type 2 is suitable for the hard welding wire, such as those made of solid cored carbon steel and stainless steel.
- Type 3 is suitable for the flux cored welding wire.

Use the pressure handle to adjust the wire feeding wheel pressure, so as to feed the welding wire into the conduit and to allow the welding wire with a little braking force while coming out of the contact tube, which will avoid slipping on the wire feeding wheel.

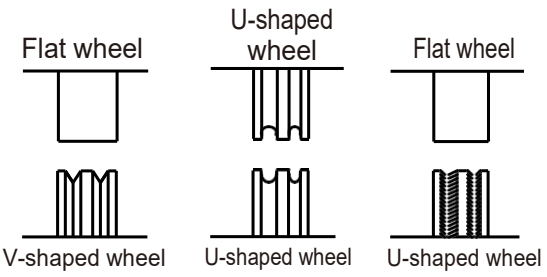
Note: The excessive pressure will make the welding wire flattened and the coating damaged, and will result in the rapid wear of wire feeding wheel and the increased resistance of wire feeding.

Table 6-2

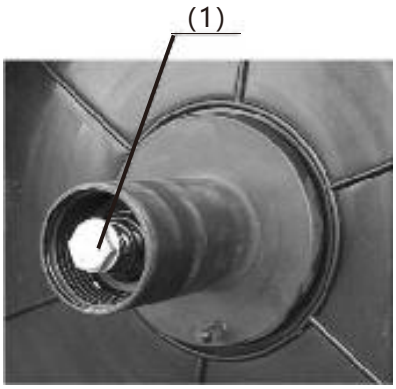
Welding wire diameter / Wire feeding wheel type / Pressure scale	ϕ 0. 8	ϕ 1. 0	ϕ 1. 2
1	3	3	2.5
2	1. 5	1.5	1. 5
3	—	—	2



Pressure handle scale



5-3 Braking and Adjustment of Wire Reel



Use the screw wrench to turn the braking force control screw (1) to adjust the braking force (as shown in Fig. 6-3); the braking force should be moderate. Adjust the braking force to an appro
-priate level so that the welding wire on the wire reel is not too loose, thus preventing the weld- ing wire from scattering when the wire reel stops; the braking force cannot be too large, otherwise the motor load will be increased.

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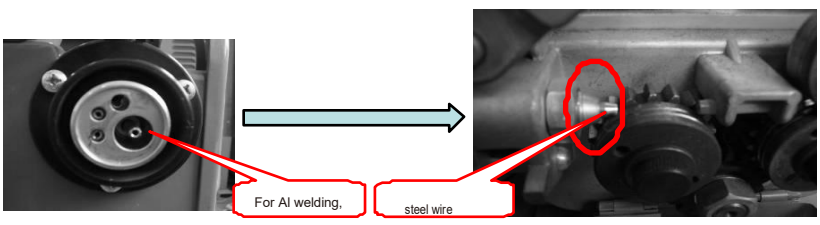
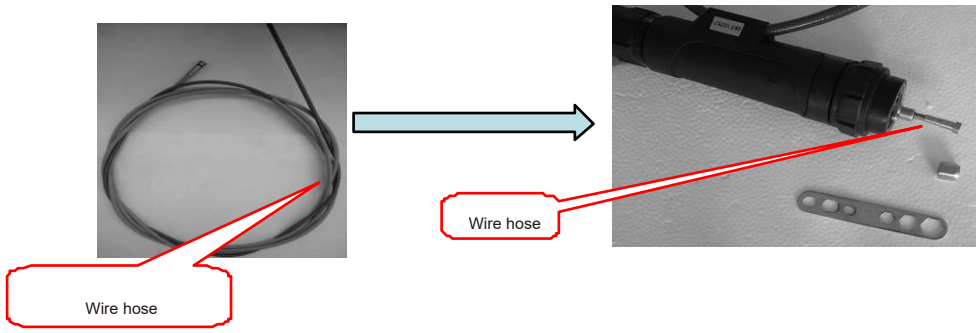
Installation of Welding Torch

6-1 Installation of Gas Shielded Arc Welding Torch

In order to ensure the smooth welding progress, please make sure that the wire feeding conduit and contact tube agree with the model of the welding torch. The wire feeding conduit is compatible with the diameter of all welding wires used and the type of welding wire. The wired hose is suitable for the hard welding wire, such as those made of solid cored carbon steel and stainless steel. The Teflon hose is suitable for the soft wire, such as those made of aluminum and its alloys and those made of copper and its alloys. When the wire feeding conduit is too tight or too loose, the resistance of wire feeding will be increased and thus the wire feeding will be unstable. Tighten the torch's quick connector to ensure there is no voltage drop on the contact surface. The pressure drop caused by loose contact will make the torch and the wire feeder heated.



- The wire feeding hose made of steel wire and its installation are shown in the figure below:



07

7-1 Precautions for use

- The enclosure upper cover shall be riveted with the equipment number plate, otherwise the internal components may be damaged.
- The welding cable and the output socket of welding machine shall be connected closely and reliably. Otherwise, the socket may be burned and the instability may be caused in the welding process.
- Avoid that the welding cable is contacted with the metal object on the ground to prevent the output short circuit of welding machine.
- Avoid damage and break of the welding cable and the control cable.
- Avoid that the welding machine is deformed due to impact, and never stack the heavy object on the welding machine.

7-2 Regular inspection and maintenance of welding machine

Ensure smooth ventilation.

- Ask the professional maintenance personnel to deduct the welding source with the compressed air every 3-6 months, and pay attention to inspect whether the fastener inside the machine is loose.
- Frequently inspect whether the cable is damaged, whether the adjusting knob is loose and whether the component on the panel is damaged.
- Timely replace the contact tube and the wire feeding wheel, and frequently clean the

wire feeding hose.

7-3 Welding machine troubles and trouble-shooting

Before repair of the welding machine, inspect the followings:

- Whether the front panel state and the welding condition display of welding machine are correct, and whether the key and the knob function normally.
- Whether the line voltage of three-phase source is in the range of 220V-380V; whether the phase is deficient.
- Whether the input cable of welding machine power supply is connected correctly and reliably. Whether the grounding wire of welding machine is connected correctly and reliably.
- Whether the welding cable is connected correctly and is in good contact.
- Whether the gas circuit is in good condition, and whether the gas regulator or the proportioner functions normally.

Notes: The maximum voltage inside the machine is up to 600V, so to ensure safety, never open the enclosure without permission. In maintenance, take proper safety protection measures like electric shock prevention. In installation of welding cable and replacement of welding torch accessories, turn off the power

גרסה בעברית :

1.הקדמה

מכונת הריתוך הדיגיטלית מדגם 0500355 מבית B.Tech היא מכונת ריתוך חדישה בטכנולוגיית אינוורטר עם שליטה מלאה בפרמטרים. המכשיר מיועד לריתוך חצי אוטומטי בגז מגן (MIG), כולל פונקציות Pulse ו Double Pulse-וכן ריתוך בטכניקות MMA ו-TIG. המכונה מתאימה למגוון רחב של חומרים: פלדה רגילה, נירוסטה, אלומיניום, נחושת, חוטים עם ליבה (Flux Cored) ועוד.

2.אמצעי בטיחות כלליים

- אין לגעת ברכיבים חשמליים חשופים.
- יש לעבוד אך ורק כאשר המכונה מוארקת היטב.
- אין להשתמש במכונה בקרבת חומרים דליקים.
- יש לעבוד עם ציוד מגן מלא: מסכת ריתוך, כפפות, ביגוד מגן.
- חובה אוורור מלא של אזור העבודה – עשן הריתוך עלול להזיק.
- אין לחמם או לקרב לפיד לרכיבי בלון גז.
- אין לפתוח את גוף המכונה בזמן עבודה או ללא ניתוק מוחלט מהחשמל.

3.תנאי סביבה והתקנה

- טמפרטורת סביבה −10°C :עד.+40°C
- לחות: נמוכה, הרחק ממקורות מים.
- מרחקי אוורור נדרשים: לפחות 20 ס"מ מקדימה ומאחור, 10 ס"מ מהצדדים.
- אין להפעיל בשמש ישירה או גשם.

- יש להשתמש במתח תלת-פאזי 380 V±10% עם הארקה תקנית.

4. הפעלה בסיסית וחיבורים

- חיבור שלילי (–): לחיבור גוף העבודה.
- חיבור חיובי (+): לחיבור מזין החוט.
- חיבור גז: באמצעות צינור מהווסת למזין.
- חיבור חשמל: כבל תלת-פאזי ללוח חשמל ראשי.
- הפעלה: לבחור מצב ריתוך, סוג חומר, קוטר חוט, ולכוונן זרם ומתח בהתאם.

5. הפעלת מצבי ריתוך

- **2T**: לחיצה להפעלה, שחרור לכיבוי.
- **4T**: לחיצה ראשונה להתחלה, שנייה לסיום.
- **SPOT**: ריתוך בנקודות קצרות.

6. מזין חוט – התקנה וכיוונון

- מנגנון הזנה חד-גלגלי.
- התאמת גלגלת ולחץ לפי סוג החוט:

קוטר חוט	טיפוס גלגלת	לחץ מומלץ
0.8 מ"מ	טיפוס 1	3
1.0 מ"מ	טיפוס 1	3
1.2 מ"מ	טיפוס 1	2.5

- לחץ יתר עלול לפגוע בציפוי החוט ולגרום לשחיקה של גלגלות ההזנה.

7. התקנת לפיד ריתוך

- יש לוודא התאמה בין קוטר החוט, סוגו וצינור ההזנה.
- לחוטי אלומיניום: שימוש בצינור טפלון.
- לחוטי פלדה: שימוש בצינור פלדה.
- יש להדק את מחבר הלפיד למניעת נפילות מתח.

8. תחזוקה תקופתית וטיפול בתקלות

- ניקוי פנימי באוויר דחוס אחת ל־3–6 חודשים.
- אין להניח משקל על המכונה.
- לבדוק קבוע: תצוגות, כפתורים, תקינות גז, חשמל, הארקה.

- אין לפתוח את המכסה הפנימי – מתח פנימי עשוי להגיע ל־600V.
- יש להחליף צינורית חוט וגלגלות בעת בלאי.

9. מפרט טכני מלא

פרמטר	ערך
מתח כניסה נומינלי	380V ±10%
זרם כניסה	MIG: 31A, MMA: 34A, TIG: 24A
מתח ללא עומס	70V
מקדם הספק	COSφ = 0.73
נצילות	85%
ממדים	870×410×630 מ"מ
משקל	40 ק"ג

10. פרמטרים לריתוך Pulse / Double Pulse

פרמטר	טווח עבודה	ברירת מחדל
זרם ריתוך	24–350A	
תדירות פולס (Hz)	0.5–5	1.5
יחס פולס (Duty)	20%–80%	50%
זרם בסיס (BA)	30%–85%	50%
זרם שיא (PA)	1.5–17.5A	4.2A
זמן גז לפני ריתוך	שנייה 0.1	
זמן גז לאחר ריתוך	1 שנייה	

תודה על בחירתך במוצרי B.Tech Tools. שימוש נכון במכונה מבטיח תוצאות מקצועיות, בטוחות ועמידות לאורך זמן.