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# **User Manual of Inverter Shielded Welding Series**

## **DIGITAL CO<sub>2</sub> SHIELDED WELDING MACHINE**








Read carefully and understand **RULES FOR SAFE OPERATION** and instructions before operating. Failure to follow the safety rules and other basic safety precautions may result in serious personal injury.






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# 1. Safety Caution

Pay attention to protection during welding, for welding may injure you and others. See Operator Safety Protection Guide for accident prevention of manufacturer for details.

	<p>The equipment shall be operated only by trained professionals!</p> <ul style="list-style-type: none"> <li>● Use welding PPE recognized by national safety supervision department.</li> <li>● Operator must be special operation personnel holding valid operation certificate.</li> <li>● Cut off power supply before maintaining welding machine.</li> </ul>
	<p>Electric shock –may cause serious injury and even death!</p> <ul style="list-style-type: none"> <li>● Mounting earthing device according to application standards.</li> <li>● Do not contact live parts when you have your skin exposed or wear wet gloves or clothes.</li> <li>● Ensure insulation between you and ground and workpiece.</li> <li>● Make sure your area is safe.</li> </ul>
	<p>Smoke –may be harmful to health!</p> <ul style="list-style-type: none"> <li>● Keep your head free from smoke. Avoid inhaling waste welding gas.</li> <li>● Use ventilation or air draft device during welding, to keep air circulation in working environment.</li> </ul>
	<p>Arc light radiation-may damage your eyes and burn your skin!</p> <ul style="list-style-type: none"> <li>● Use suitable welding mask and wear protective suit to protect your eyes and body.</li> <li>● Erect appropriate shield or curtain, to keep onlooker from injury.</li> </ul>
	<p>Misoperation may cause fire or explosion.</p> <ul style="list-style-type: none"> <li>● Welding spark may cause a fire. Make sure no combustibles near to welding area and pay attention to fire safety.</li> <li>● Make sure extinguishing device is near and that one trained person nearby can use fire extinguisher skillfully.</li> <li>● Do not weld closed container.</li> <li>● Do not use machine pipeline for unfreezing.</li> </ul>

	<p>Hot workpiece may lead to severe scald.</p> <ul style="list-style-type: none"> <li>● Do not contact hot workpiece with bare hands.</li> <li>● Ensure certain cooling time after using welding gun continuously.</li> </ul>
	<p>Noise-excess noise is harmful to your hearing!</p> <ul style="list-style-type: none"> <li>● Protect your ears. Use ear cover or other hearing protective equipment.</li> <li>● Remind onlooker that noise may have potential damage to hearing.</li> </ul>
	<p>Magnetic field influences cardiac pacing!</p> <ul style="list-style-type: none"> <li>● Before consulting doctor, pacemaker user should keep away from welding site.</li> </ul>
	<p>Moving parts may cause personal injury!</p> <ul style="list-style-type: none"> <li>● Avoid moving parts (e.g. fan).</li> <li>● Various protective devices (e.g. door, panel, cover and baffle) shall be closed and mounted completely.</li> </ul>
	<p>Fault—ask professionals for help in case of a difficulty.</p> <ul style="list-style-type: none"> <li>● In case of a difficulty during installation or operating, implement troubleshooting according to relevant contents of this Manual.</li> <li>● If failing to understand completely after reading or resolve problem according to this Manual, contact your supplier or Service Center of the Company immediately for help of professionals.</li> </ul>

**Note: Welding machine should be mounted horizontally , with gradient not more than 15°.**



## 2. Product Overview



### ➤ Features of Welding Machine


- With fully digital control, it could realize full current fine control, and thus better electric arc centrality is yielded.
- The advanced control technology could realize rapid electric arc response, and arc length adjusting ability is strong.
- Better operability in case of manual welding.
- Fully digital panel displays functional parameters; uniform regulation facilitates convenient and concise operating.
- Welding speed is higher than that of ordinary pulse gas shielded welding. Low heat, large depth of fusion and no splashing.
- Obvious energy saving effect.
- Low splashing, fast welding speed and wide voltage matching range of ordinary gas shielded welding. Fast arc response; easy to learn for welders.
- Wire drawing gun function.


## 2.1 Handling and Hoisting

1. Cut off power supply and dismantle power line before moving welding machine;
2. Keep bottom of welding machine downwards during handling. Do not place welding machine horizontally or upside down;
3. Ensure vertical hoisting;
4. Avoid welding machine moving during long-distance transportation, place shock absorbing foam in surrounding area and meanwhile, pay attention to rain proofing.

## 2.2 Identification

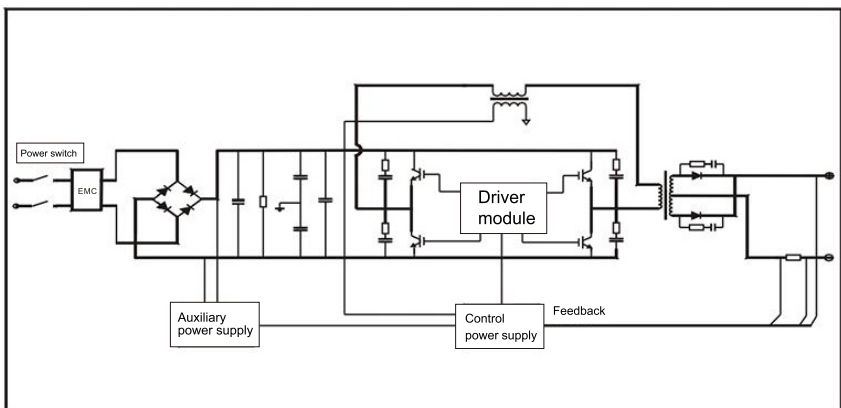
Read the contents of introductions:  

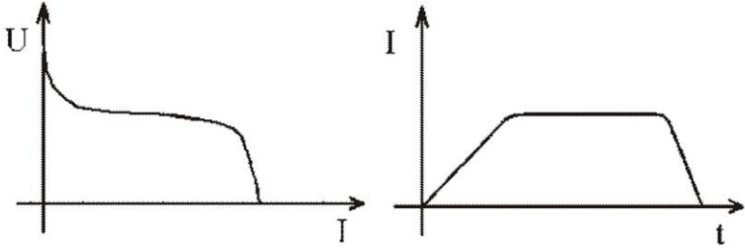
Single (three)-phase static frequency changer-transformer-rectifier: 

Symbol of manual welding: 

Symbol of gas shielded welding: 

## 3. Electrical Diagram and Leveling Characteristic Diagram

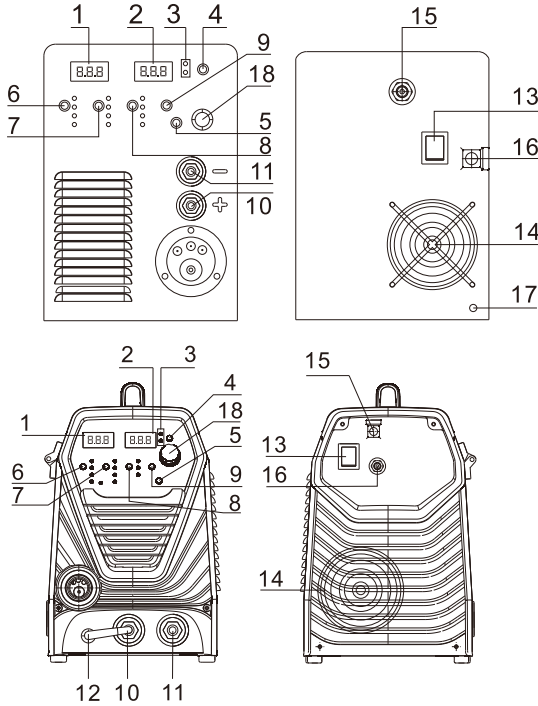




## 6. TECHNICAL DATA

ITEM	MIG/MMA-160	MIG/MMA-180	MIG/MMA-200	MIG/MMA-250
Input Voltage(Vac)	1~220V ±10% 1~230V ±10%	1~220V ±10% 1~230V ±10%	1~220V ±10% 1~230V ±10%	1~220V ±10% 1~230V ±10%
Frequency(Hz)	50/60	50/60	50/60	50/60
Capacity(KVA)	4.5	5	5.6	7
Current(A)	50~160	50~180	50~200	50~200
Rated Duty Cycle	60%	60%	60%	60%
Power factor	0.93	0.93	0.93	0.93
Efficiency(%)	85	85	85	85
Wire Feeder	Inner	Inner	Inner	Inner
Wire Speed(m/min)	2.5~12	2.5~12	2.5~12	2.5~12
Roller diameter(mm)	R=200	R=200	R=200	R=200
Wire diameter(mm)	0.6/0.8/1.0	0.6/0.8/1.0	0.6/0.8/1.0	0.6/0.8/1.0
Dimension(mm)	L420XB220XH350	L420XB220XH350	L420XB220XH350	L420XB220XH350
Weight(Kg)	10.6	10.6	10.6	10.6
Insulation Class	H	H	H	H
Production Degree	IP21S	IP21S	IP21S	IP21S

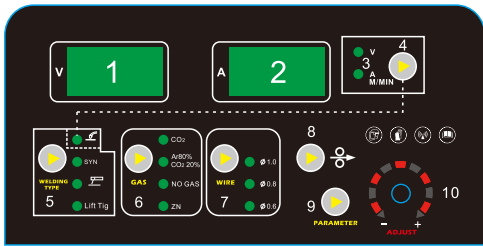
## 5. Panel Functions



Front Panel/Rear Panel			13	Power switch	Power on/off of controller
No.	Name	Function	14	Fan	Cooling welding machine and extend duty cycle
1	Voltage digital display meter	Display output voltage	15	Gas input	Connect gas pipe
2	Current digital display meter	Display preset current	16	Power input	Power input
3	Indicator lamp	Indicate current/voltage/wire feeding speed	17	Earthing screw	Ensure safety of welding equipment and personnel. The necessary measure for normal operation of equipment
4	Option key	Adjust current/voltage/wire feeding speed	18	Adjusting knob	Adjust various parameters
5	Parameter key	Switch function key	19	Aviation plug	Draw wire for power supply
6	Process key	Switch gas shielded welding/uniform/manual welding/simple argon arc welding			
7	Gas key	Select gas			
8	Welding wire key	Select welding wire			
9	Inching wire feeding key	Feed wire by inching			
10	Positive output	Select welding output cable			
11	Negative output	Connect welding output cable			
12	Conversion interface	Gasless/gas-filled conversion			

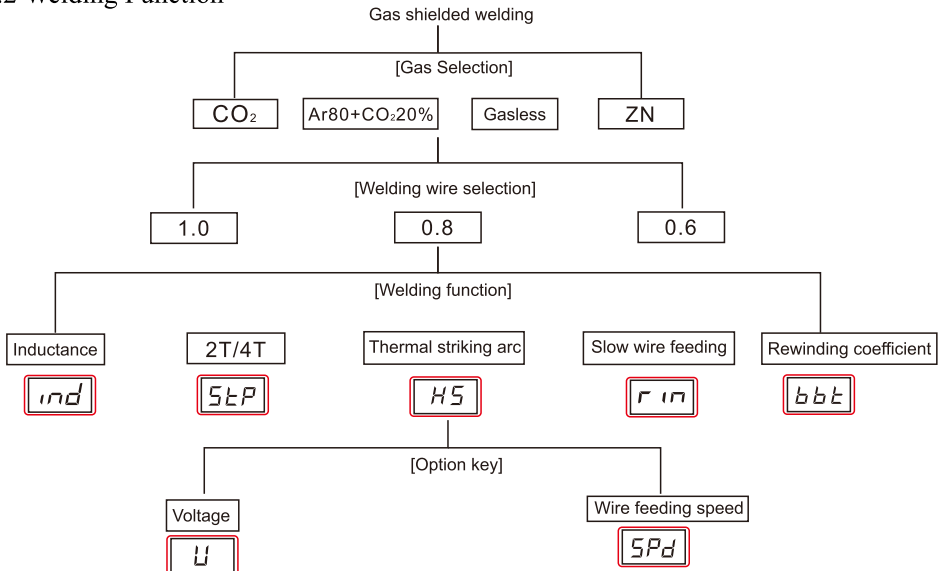
## 6. Operating Introductions

### 6.1 Operating Panel



1	Voltage display meter	6	Gas key
2	Current display meter	7	Welding wire key
3	Current/voltage/wire feeding speed indication	8	Inching wire feeding key
4	Current/voltage/wire feeding speed selection	9	Parameter key
5	Process key	10	Adjusting knob

### 6.2 Welding Function



## 6.2 Operating Function

**Slow wire feeding:** Improve arc striking effect.

Rewinding coefficient: Adjust welding wire recycling length after welding is finished, to avoid welding wire sticking to workpiece and ensure welding quality of next time.

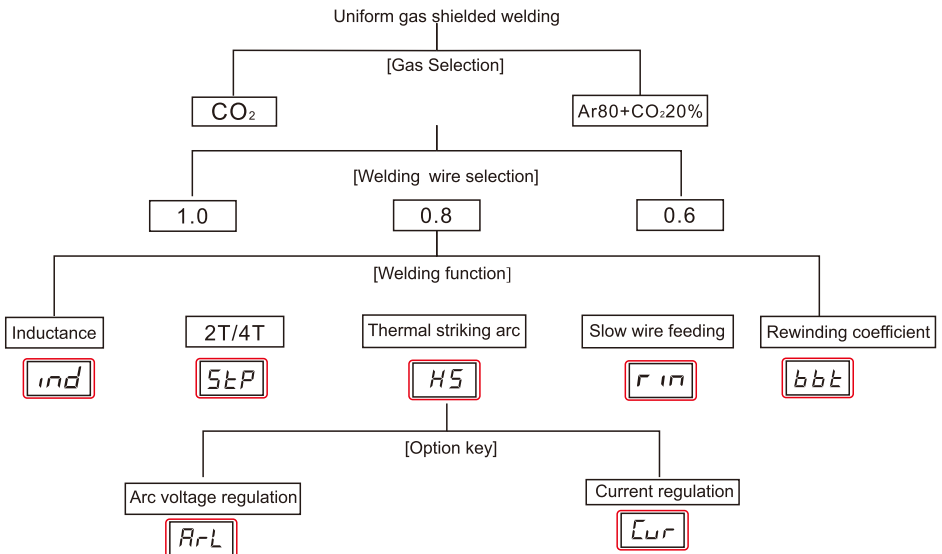
Thermal striking arc: Inverter welding machine is difficult to strike arc under low no-load voltage and small current. Improving striking arc means increasing instantaneous short circuit welding current, so as to reach the state where arc striking is easy.

**Inductance:** The increased inductance gives rise to soft arc, small depth of fusion, small splashing and wide welding joint. Small current welding of thin welding wire generates low inductance, hard arc, large depth of fusion, narrow welding joint and clear welding sound.

**2T/4T:** 2T-Press gun switch to start welding 4T-Press gun switch, welding wire will under regulation and control of voltage and current of wire feeder; release welding gun, welding machine will be still under regulation and control of wire feeder. Press welding gun switch again, welding machine will be under arc resumption voltage and current control of panel; release gun switch, welding machine will stop operation.

**Function regulation:** Step 1: Press process key 1, to switch to gas shielded welding mode. Step 2: Press gas key 6, to switch to gas confirming to actuality. Step 3: Press welding wire key 7, to switch to welding wire conforming to actuality. Step 4: Press parameter key 9, to switch to various functions. Step 5: Rotate adjusting knob 10, to adjust parameter value. Step 6: Press option key 4, to adjust voltage and wire feeding speed.

**Note: 1. Connect positive pole if a gas-filled welding gun; connect negative pole for gasless gas gun. 2. Long press inching wire feeding key, to star inching wire feeding.**

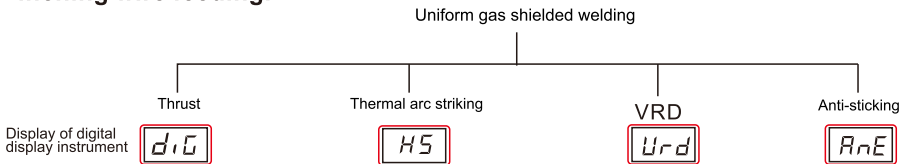


## 6.2 Exclusive Functions of Unified Gas Shielded Welding

**Arc voltage regulation:** Voltage fine tuning under uniform state.

Function regulation: Step 1: Press process key 5, to switch to uniform mode of gas shielded welding. Step 2: Press gas key 6, to switch to gas confirming to actuality. Step 3: Press welding wire key 7, to switch to welding wire conforming to actuality. Step 4: Press parameter key 9, to switch to various functions. Step 5: Rotate adjusting knob, to adjust parameter value. Step 6: Press option key, to adjust arc voltage and current.

**Note: 1. Regulate current under uniform state, voltage will be regulated automatically with current. 2. Long press inching wire feeding key, to start inching wire feeding.**



**Thrust:** Means increasing certain output current of welding machine on the basis of original given current when distance between welding rod and workpiece is too near and arc voltage is lower than certain value, so as to stabilize arc voltage, which is applied for the reason that arc voltage will change constantly during welding. In general, thrust works under small current; does not work under large current.

**Thermal arc striking:** Increase output current instantaneously in case of arc striking, so as to improve success rate of arc striking, which is particularly suitable for small current welding.

**VRD:** Anti-shock device: Lower voltage of welding machine under no-load state (arc striking is not affected). In general, safety will be threatened when voltage of inverter welding machine is above 60 V. VRD function means making no-load voltage of welding machine (arc striking is not affected) lower than safety voltage 36 V, to ensure safety of production operation.

**Anti-sticking:** Welding rod is easy to stick to workpiece in general after welding rod and workpiece have short circuit during welding. Anti-sticking function means lowering short circuit current of welding to 10A or below within 3s, making welding rod falling from workpiece automatically, so as to realize smooth welding.

Function regulation: Step 1: Press process key 5 to switch to manual welding mode. Step 2: Click parameter key 9 to switch to manual welding function. Step 3: Rotate adjusting knob to adjust parameter value.

Function regulation of improving arc striking: Step 1: Press process key to switch to arc striking improvement mode. Step 2: Rotate adjusting knob to adjust current.

## 7. Recommended Welding Parameters of CO<sub>2</sub> Gas Shielded Welding

(1) Welding condition of transverse fillet weld (example)

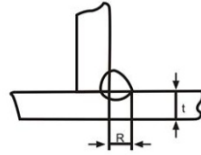


Plate Thickness t (mm)	Length of Weld Leg (mm)	Diameter of Welding Wire (mm)	Welding Current (A)	Arc Voltage (v)	Welding Speed (cm/min)	CO <sub>2</sub> Flow (L/min)
1.2	2.5-3.0	0.9,1.0	70-100	18-19	50-60	10-15
1.6	2.5-3.0	0.9-1.2	90-120	18-20	50-60	10-15
2.0	3.0-3.5	0.9-1.2	100-130	19-20	50-60	15-20
2.3	3.0-3.5	0.9-1.2	120-140	19-21	50-60	15-20
3.2	3.0-4.0	0.9-1.2	130-170	19-21	45-55	15-20
4.5	4.0-4.5	1.2	190-230	22-24	45-55	15-20
6.0	5.0-6.0	1.2	250-280	26-29	40-50	15-20
9.0	6.0-7.0	1.2	280-300	29-32	35-40	15-20
12.0	7.0-8.0	1.2	300-340	32-34	30-35	20-25

(2) Welding condition of horizontal fillet weld (example)

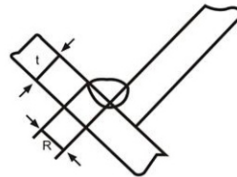


Plate Thickness t (mm)	Length of Weld Leg (mm)	Diameter of Welding Wire (mm)	Welding Current (A)	Arc Voltage (v)	Welding Speed (cm/min)	CO <sub>2</sub> Flow (L/min)
1.2	2.5-3.0	0.9,1.0	7.-100	18-19	50-60	10-15
1.6	2.5-3.0	0.9-1.2	90-120	18-201	50-60	10-15
2.0	3.0-3.5	0.9-1.2	100-130	19-20	50-60	15-20
2.3	3.0-3.5	0.9-1.2	120-140	19-21	50-60	15-20
3.2	3.0-4.0	0.9-1.2	130-170	20-22	45-55	15-20
4.5	4.0-4.5	1.2	200-250	23-26	45-55	15-20
6.0	5.0-6.0	1.2	280-300	29-32	40-50	15-20
9.0	6.0-8.0	1.2	300-350	32-34	40-50	15-20
12.0	10.0-12.0	1.2	320-350	33-36	25-35	20-25



(3) Welding condition of I-shape butt joint (example, no liner)

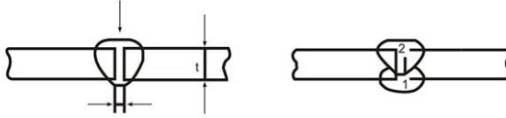


Plate Thickness t (mm)	Length of Weld Leg (mm)	Diameter of Welding Wire (mm)	Welding Current (A)	Arc Voltage (v)	Welding Speed (cm/min)	CO <sub>2</sub> Flow (L/min)	Number of Layers	
1.2	0	0.9,1.0	7018-19-80	17-18	45-55	10	1	
1.6	0	0.9,1.0	80-100	19-20	45-55	10-15	1	
2.0	0-0.5	1.9,1.0	100-110	19-20	50-55	10-15	1	
2.3	0.5-1.0	0.9-1.2	110-130	19-20	50-55	10-15	1	
3.2	1.0-1.2	0.9-1.2	130-150	19-21	40-50	10-15	1	
4.5	1.2-1.5	1.2	150-170	21-23	40-50	10-15	1	
6.0	1.2-1.5	1.2	220-260	24-26	40-50	15-20	Outside 1	2
							Inside 1	
9.0	1.2-1.5	1.2	320-340	32-34	45-55	15-20	Outside 1	2
							Inside 1	

(4) Welding condition of V and X-shape grooves (example)

Plate Thickness t (mm)	Groove Shape	Root Opening g (mm)	Root Height g (mm)	Diameter of Welding Wire (mm Φ)	Welding Current (A)	Arc Voltage (V)	Welding Speed (cm/min)	CO <sub>2</sub> Flow (L/min)	Number of Layers	
12		0-0.5	4-6	1.5	300-350	32-35	30-40	20-25	Outside	2
					300-350	32-35	45-50	20-25	Inside	
				1.6	380-420	36-39	35-40	20-25	Outside	
					380-420	36-39	45-50	20-25	Inside	
16		0-0.5	4-6	1.2	300-350	32-35	25-30	20-25	Outside	2
					300-350	32-35	30-35	20-25	Inside	
				1.6	380-420	36-39	30-35	20-25	Outside	
					380-420	36-39	35-40	20-25	Inside	
16		0	4-6	1.2	300-350	32-35	30-35	20-25	Outside	2
					300-350	32-35	30-35	20-25	Inside	
				1.6	380-420	36-39	35-40	20-25	Outside	
					380-420	36-39	35-40	20-25	Inside	
19		0	5-7	1.6	400-450	36-42	25-30	20-25	Outside	2
					400-450	36-42	25-30	20-25	Inside	
				1.6	400-420	36-39	45-50	20-25	Outside	
					400-420	36-39	35-40	20-25	Inside	
25		0	5-7	1.6	400-420	36-39	40-45	20-25	Outside	4
					420-450	39-42	30-35	20-25	Inside	

(5) Welding condition of lap fillet weld (example)

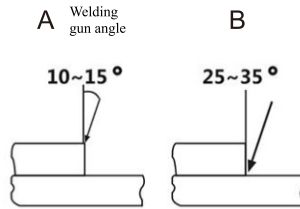


Plate Thickness t (mm)	Diameter of Welding Wire (mm)	Welding Current (A)	Arc Voltage (v)	Welding Speed (cm/min)	Welding Gun Angle	CO <sub>2</sub> Flow (L/min)
1.2	0.8-1.0	80-100	18-19	45-55	A	10-15
1.6	0.8-1.2	100-120	18-20	45-55	A	10-15
2.0	1.0-1.2	100-130	18-20	45-55	A or B	15-20
2.3	1.0-1.2	120-140	19-21	45-50	B	15-20
3.2	1.0-1.2	130-160	19-22	45-50	B	15-20
4.5	1.2	150-200	21-24	40-45	B	15-20

7.1 Recommended Parameters of Pulse Carbon Steel Welding

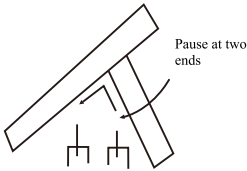
(1) Welding condition of Horizontal fillet weld (example)

Plate Thickness t (mm)	Length of Weld Leg (mm)	Welding Gun Angle and Position	Number of Layers	Welding Current (A)	Arc Voltage (V)	Welding Speed (cm/min)
3.2	3-4	<p>Center position</p>	1	150	26-27	60
4.5	5		1	170	26-27	40
6.0	6		1	200	27-28	40
8.0	8		<p>Advancing angle 10°</p> <p>1mm(2-3mm)</p>	1	250	29-30
12.0	10		1	180-200	25-27	45
16.0	12		2	180-200	25-28	45
			3	180-200	25-28	45
16.0	12		1	220-230	25-28	45
			2	220-230	25-28	45
			3	210-220	25-28	45

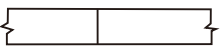

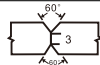
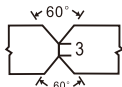
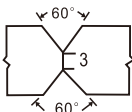
(2) Condition of vertical down welding (example)

Plate Thickness (mm)	Joint Shape	Welding Current (A)	Arc Voltage (V)	Welding Speed (cm/min)	Remarks
2.3	Butt joint	100	22-23	70	Penetration bead OK
3.2	Angle joint	100	21-22	70	Weld leg 4-5 mm; weld thickness 2.5 mm

(3) Condition of vertical upward welding (example)

Plate Thickness (mm)	Joint Shape	Welding Current (A)	Arc Voltage (V)	Remarks
12		10-100	20-21	Swinging Weld leg 10 mm

(4) Condition of plane docking two-side welding (example, semiautomatic)

Plate Thickness (mm)	Groove Shape	Number of Layers	Welding Current (A)	Arc Voltage (V)	Welding Speed (cm/min)
6.0		1	170	25-26	30
		2	180	26-27	30
9.0		1	270	29-30	30
		2	290	30-31	30
12.0		1	280	30-31	40
		2	330	33-34	40
190		Outside 1	300	31-32	45
		Outside 2	300	31-32	45
		Outside 1	340	32-33	45
		Outside 2	280	30-31	45
25		Outside 1	300	31-32	45
		Outside 2	320	32-33	45
		Outside 3	320	32-33	45
		Outside 1	340	32-33	45
		Outside 2	320	32-33	45
		Outside 3	320	32-33	45

(5) Condition of one-side welding (example, automatic)

Plate Thickness (mm)	Groove Shape	Number of Layers	Welding Current (A)	Arc Voltage (V)	Welding Speed (cm/min)
3.2		1	140	24-25	50
6.0		1	130	23-24	25
		2	150	25-26	25
12.0		1	180	24-25	25
		2	290	30-32	25
12.0		1	180-190	24-25	25
		2	200	25-26	25
		3	200	26-27	25
190		1	180	24-25	25
		2	300	29-30	25
		3	300	29-30	25

Swinging amplitude of backing run: 2 mm

Number of swings: 120 swings/min

(6) Condition of one-side V-shape groove fusion welding (example, semi-automatic)

Diameter of welding wire: 1.2 mm Gas: 20% CO<sub>2</sub> + Ar

Groove Shape	Number of Layers	Welding Current (A)	Arc Voltage (V)	Remarks
	1	100	20-27	Small swing
	2	280	26-27	Small swing
	3	280	26-27	Small swing
	4	280	26-27	Small swing
	5	280	26-27	Small swing
	6	280	26-27	Swing
	7	280	26-27	Swing
	1	100	20-21	Swing
	2	130	21-22	Swing
	3	130	21-22	Swing
	4	130	21-22	Swing
	5	130	21-22	Swing
	6	12	19-20	Swing
	1	100-200	20-22	No swing
	2	200	24-25	No swing
	1			
	8	180	24-25	No swing
	9			
	12			

## 7.2 Recommended Parameters of Aluminum Alloy Pulse

### (1) Welding condition of I-shape butt joint (example)

Plate Thickness (mm)	Diameter of Welding Wire (mm)	Welding Current (A)	Arc Voltage (V)	Welding Speed (cm/min)	Thousands of Elongation (mm)	Gas Flow (L/min)
1.5	1.2	60-80	16-18	60-80	12-15	20
2.0	1.2	70-80	17-18	40-50	15	20
3.0	1.2	80-100	17-20	40-50	15	20
4.0	1.2	90-120	18-21	40-50	15	20
6.0	1.2,1.6	150-180	20-23	40-50	15-18	20

### (2) Welding condition of horizontal fillet weld (example)

Plate Thickness (mm)	Diameter of Welding Wire (mm)	Welding Current (A)	Arc Voltage (V)	Welding Speed (cm/min)	Thousands of Elongation (mm)	Gas Flow (L/min)
1.5	1.2	60-80	16-18	60	15	15-20
3.0	1.2	100-120	19-21	60	15	15-20
6.0	1.2,1.6	150-180	20-23	50-60	15	20

## DC MIG Welding Condition of Aluminum Alloy (for Reference)

### (1) Condition of I-shape butt joint (example)

Plate Thickness (mm)	Diameter of Welding Wire (mm)	Welding Current (A)	Arc Voltage (V)	Welding Speed (cm/min)	Thousands of Elongation (mm)	Gas Flow (L/min)
3.0	1.2	120-140	20-22	60-80	15	20
4.0	1.2	150-170	22-24	60-80	15-18	20
6.0	1.6	180-210	23-25	40-60	17-20	20-25

### (1)Welding condition of horizontal fillet weld (example)

Plate Thickness (mm)	Diameter of Welding Wire (mm)	Welding Current (A)	Arc Voltage (V)	Welding Speed (cm/min)	Thousands of Elongation (mm)	Gas Flow (L/min)
3.0	1.2	140-160	21-22	60-70	15	15-20
4.0	1.2	150-170	22-24	50-60	15-18	15-20
6.0	1.6	200-230	24-26	50-65	17-20	20-25

## 8. Installation, Debugging and Operating

Note: Install and debug the equipment in strict accordance with the following steps.

Turn off power switch of distribution box before electrical wiring and operating.

Protection grade of the equipment is IP21S. Do not use the equipment in rain.

Wiring Method of Distribution Box (See Below)

	<ol style="list-style-type: none"><li>1. Power switch of distribution switch</li><li>2. Fuse or fuse protector not less than maximum output current of nameplate (<math>I_{I\max}</math>)</li><li>3. Welding machine cable</li><li>4. Yellow and green earthing wires (grounded rather than connected with null wire)</li></ol> <p>Finish wiring according to the method as shown in the figure or other proper method; cut off general power supply during wiring.</p> <p>Note: Hot-line work is highly forbidden.</p> <ul style="list-style-type: none"><li>● Assign professional electrician to finish wiring.</li><li>● Do not connect two welding machines onto the same switch box.</li><li>● Wire 4 is not required to be grounded if shell is grounded.</li></ul>
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### Installation and Debugging of Manual Welding

#### 1. Installation method

(1) Adjust process key on front panel of welding machine to manual welding mode;

(2) Connect cable with earth clamp to positive pole quick socket below front panel of welding machine and tighten it with wrench;

(3) Connect cable with earth clamp to negative pole quick socket below front panel of welding machine and tighten it with wrench;

(4) Turn off switch of distribution box (user equipment), connect power wire on rear panel of welding machine onto output terminal of distribution box. Group yellow and green power wires, to finish power wire connection. (See above diagram)

**Note: Operator can select DC positive wiring method according to base metal and welding rod condition (i.e. connect electrode holder to negative pole). No special provisions are specified for acid welding rod.**

Positive wiring method: Connect welding handle to negative pole and workpiece to positive pole.

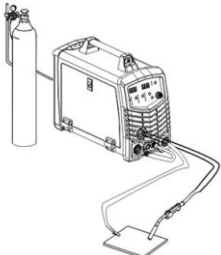


Inverse wiring method: Connect workpiece to negative pole and welding handle to positive pole.

#### 2. Operating method

(1) After installing as per the above method, turn on air switch on rear panel, to start welding machine. At this time, voltage displayed by gauge is non-load voltage and current displayed by ampere meter is preset current. Reset current value will change within the range between the maximum and minimum values by adjusting current knob of manual welding.

(2) Preset welding current according to specifications and model of welding rod, clamp welding rod and finish welding through short circuit arc striking. Welding current can be self-adjusted according to welding needs and welder's habits.

## Installation and Debugging of Gas Shielded Welding

Gas-filled welding gun connection		
1. Connect welding gun to welding gun interface.	2. Connect earth clamp to output end of negative pole and tighten it.	3. Connect conversion interface to positive pole.
Gasless welding gun connection		
1. Connect welding gun to welding gun interface.	2. Connect earth clamp to output end of positive pole and tighten it.	3. Connect conversion interface to negative pole.
 <p>Connection of Gas-filled Welding Gun</p>	 <p>Connection of Gasless Welding Gun</p>	 <p>Connection of wire drawing gun</p>

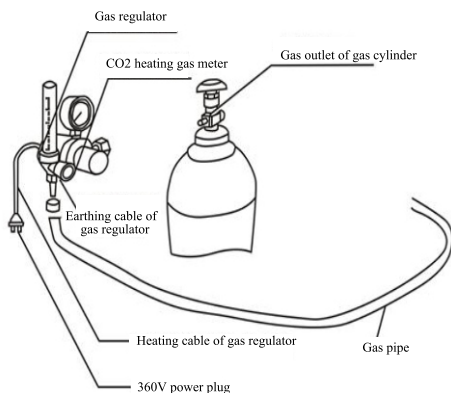
### 2. Gas cylinder connection

#### Safety warning

1. The connection must be finished by professional welding operator with corresponding qualification.
2. Read Operational Manual of CO<sub>2</sub> Heating Gas Meter carefully before installation.

Connection of gas cylinder end is shown below:

- (1) Install CO<sub>2</sub> heating gas meter onto gas cylinder outlet with mounting bolt and tighten it.
- (2) Connect one end of gas pipe to interface of gas regulating gas pipe and fix it firmly with tightening device; connect the other end to gas inlet of welding machine and fix it.



## 9. Precautions

Preparation before Use

Connect input cable of welding machine to grid according to requirements.

Note: Of which, connect the three single-color wires respectively to phase wire of three-phase power supply. Phase sequence may not be followed in connection.

Wiring must be correct and stable, and any error is not allowed; otherwise, equipment damage or personal injury may be caused.

Ensure air switch on rear panel of welding machine is under connected status (“ON” position) and that power switch of distribution board is under disconnected status ( Off position). “ ”

Note: The air switch is generally in off status and is forbidden in load status to avoid damage. Pro per welding cable should be used; connect joint and control cable, weld gun and earthing wire.

Note: Cable should be excellently contacted and tightened at every connection part (screw quick plug if rotating in clockwise direction in socket; unscrew if rotating in anticlockwise direction); otherwise, connector will be damaged.

### Operating Notice

1. Paste label of riveting equipment at the specified part of upper cover of shell; otherwise internal element will be damaged.
2. Connection between welding cable and connecting terminal of welding machine should be tight and reliable, so as to avoid burning connector and instability during welding.
3. Avoid exposed copper part of welding cable and connecting terminal of welding machine contacting ground metal, for fear of output short circuit of welding machine.
4. Avoid welding cable and control cable being damaged or broken.
5. Avoid welding machine deforming due to collision. Do not stack heavy objects on welding machine.

#### 9.1 Environment

- 1) Implement welding in a relatively dry environment, with air humidity not exceeding 90%.
- 2) Surrounding ambient temperature should be -10 – 40 °C.
- 3) Avoid welding in rain to prevent rainwater from entering welding machine.
- 4) Do not weld in dusty area or environment with corrosive gas.
- 5) Do not implement gas shielded welding in environment with strong air motion.
- 6) Confirm electromagnetic compatibility of the equipment as Class A according to requirements of CISRR 11.



## 9.2 Excellent Ventilation

Since the welding machine is an industrial welding machine, through which a strong working current will pass during operation, natural ventilation cannot meet cooling requirement of welding machine. Therefore, fan is mounted inside to cool welding machine effectively, so as to realize smooth operation. User should make sure ventilation part is not covered or blocked and that distance between welding machine and surrounding objects is not less than 0.3 m. User should always keep excellent ventilation, which is very significant to service life and smooth operation of welding machine.

## 9.3 No Excess Voltage

Welding machine will be damaged if grid voltage exceeds the permitted value. Therefore, it is required to pay attention to change of grid voltage. Shut down welding machine and turn off power switch in case that grid voltage is too high.

## 9.4 Overheating Protection

For long-term continuous operation, welding machine will enable overheating protection in case of exceeding the specified duty cycle, and welding machine will stop welding compulsorily. The welding will be resumed after overheating indicator lamp is off (shutdown is not needed).

## 10. Maintenance



Safety warning: For the following operating, operator must have enough professional electrical knowledge and comprehensive safety common sense; hold valid qualification certificate able to testify his capacity and knowledge.  
Confirm input cable of welding machine is disconnected with grid before opening shell.

- 1) Check internal circuit connection of welding machine and confirm wiring is correct and that connector is stable (particularly for plug-in connector or element). In case of any rust or loosening, polish rusting layer or oxidation film with abrasive paper, connect again and adopt tightening measures.
- 2) After powering on the machine, keep hands, hair and tools approach to live components, such as fan, to avoid injury or damage of the machine.
- 3) Blow away dust regularly with dry and clean compressed air. Dedust welding machine every day if using the machine under the environment of heavy smoke and severe air pollution. Pressure of compressed air should keep at a reasonable value, for fear that small elements in welding machine are damaged.
- 4) Avoid water or moisture entering welding machine. In such case, dry inside of welding machine, and then measure insulation of welding machine with tramegger (including insulation between any connecting point and connection point and shell). Welding shall not be implemented after testifying there is no abnormality.
- 5) Check regularly whether insulation skin of all cables of welding machine is damaged; if damaged, bind up the insulation skin or replace the cable.
- 6) Check regularly whether gas guide tube is cracked; if so, replace it.
- 7) Replace contact tube and wire feeding wheel timely and clean wire feeding hose often.
- 8) Put the welding machine back to original packaging box and store it in a dry environment if not using the welding machine for a long time.

## 11. Fault and Maintenance



Safety warning: For the following operating, operator must have enough professional electrical knowledge and comprehensive safety common sense; hold valid qualification certificate able to testify his capacity and knowledge.  
Confirm input cable of welding machine is disconnected with grid before opening shell.

### Common Faults and Solutions:

Fault	Solution
The protective lamp blinks	<ol style="list-style-type: none"> <li>1) Overheat protection                             <ul style="list-style-type: none"> <li>➤ Inspect working current and its using time, view the using parameters specified in the instruction manual, and use according to the requirements;</li> <li>➤ Inspect fan operation when the machine is used: If the fan does not operate, confirm whether there is 220 V fan power supply; if the power supply is normal, inspect the fan. If the power supply is not normal, inspect power wiring.</li> </ul> </li> <li>2) Over-current protection</li> </ol>

	It means the welding machine fails, or is interfered and interrupted by accident. Please turn of the machine and restart it. If the failure can still not be eliminated, please turn the machine off and contact with the manufacturer’s repair personnel.
Fault: The welding gun does not react, and the protective lamp does not get on after its switch is pressed.	<ol style="list-style-type: none"> <li>1) Inspect whether the power indicator lamp or the digital multi-meter is on.</li> <li>2) Inspect whether the switch of welding gun is in good contact, and inspect the interface connection of welding gun.</li> <li>3) Inspect the interface contact of wire feeder.</li> </ol>
After the switch of welding gun is pressed to supply air, the wire feeder feeds wire, but there is no current output, and the protective lamp does not get on.	<ol style="list-style-type: none"> <li>1) Inspect whether the earth wire is in good contact and eliminate poor contact.</li> <li>2) Inspect if the cables of wire feeder are connected correctly;</li> <li>3) inspect if the welding gun is damaged;</li> </ol>
After the switch of welding gun is pressed to supply air, there is current output, but the wire feeder does not feed wire.	<ol style="list-style-type: none"> <li>1) Inspect if the control cable of wire feeder is disconnected.</li> <li>2) Inspect if the wire feeder is stuck.</li> <li>3) The control panel of welding machine has problem.</li> <li>4) The wire feeder does not work.</li> </ol>
After the switch of welding machine is pressed, it can weld, but the current is too large and the voltage cannot be adjusted, and the no-load voltage is high.	<ol style="list-style-type: none"> <li>1) Inspect if the control cable of wire feeder is disconnected.</li> <li>2) The control panel of welding machine has problem.</li> </ol>
The welding current is not stable, and varies frequently.	<ol style="list-style-type: none"> <li>1) Inspect if the torque knob of wire feeder is suitable.</li> <li>2) Inspect if the wire feeding wheel and welding wire selected match with each other.</li> <li>3) Inspect if the contact tube of welding gun is seriously worn. If it is, replace and then tighten it.</li> <li>4) Inspect the wear of the wire liner of welding gun, and replace it once half a month.</li> <li>5) Confirm the source and quality of welding wires.</li> </ol>
The protection effect of the last welding bead is not good	<ol style="list-style-type: none"> <li>1) After welding is finished, do not take the welding gun away immediately so that the protective air can protect high-temperature welding bead;</li> <li>2) Lengthen protective gas shutoff time, and contact with the manufacturer.</li> </ol>
Large arc pit after welding	<ol style="list-style-type: none"> <li>1) Adopt 4T mode and take the arc with small current.</li> <li>2) Change operation mode.</li> </ol>
The gas meter does not heat	<ol style="list-style-type: none"> <li>1) The plug of heater is not plugged in place.</li> <li>2) Inspect if the self-recovery fuse inside welding machine is intact.</li> <li>3) The electric heater inside gas meter is damaged.</li> </ol>