KickingHorse®

WELDING INVERTER FOR HOME

OPERATION MANUAL

MA200TS multi-process welder

C SA US

LISTED

Serial Number: _____

Where Purchase: _____

Date of purchased: _____

CONTENT

1. Safety

- ❖ Welding may damage your body or others, so please take protection measure in operation
- ❖ Only ones who are trained professionally can install , debug, operate, maintain and repair the equipment.
- ❖ Do not maintain and repair the machine when the machine is connected with power.

Electric shock can kill

- ❖ Never touch electrical parts.
- ❖ Wear dry, hole-free gloves and clothes to insulate yourself.
- ❖ Insulate yourself from work and ground using dry insulation. Make certain the insulation is large enough to cover your full area of physical contact with work and ground.
- ❖ Ensure to install the equipment correctly and ground the work or metal to be welded to a good electrical (earth) ground according the operation manual.
- ❖ Ensure to operate the equipment in safe position.

Fumes and gasses can be dangerous

- ❖ Welding may produce fumes and gases hazardous to health. Avoid breathing these fumes and gases. When welding, keep your head out the fume.
- ❖ Using enough ventilation and/or exhaust at the arc to keep fumes and gases away from the breathing zone.

Welding sparks can cause fire or explosion

- ❖ Remove fire hazards from the welding area. If this is not possible, cover them to prevent the welding sparks from starting a fire. Remember that welding sparks and not materials from welding can easily go through small cracks and openings to adjacent areas.

Do not weld enclosed tanks or containers

- ❖ Prohibit to use welder to unfrozen.
- ❖ Have a fire extinguisher readily available.

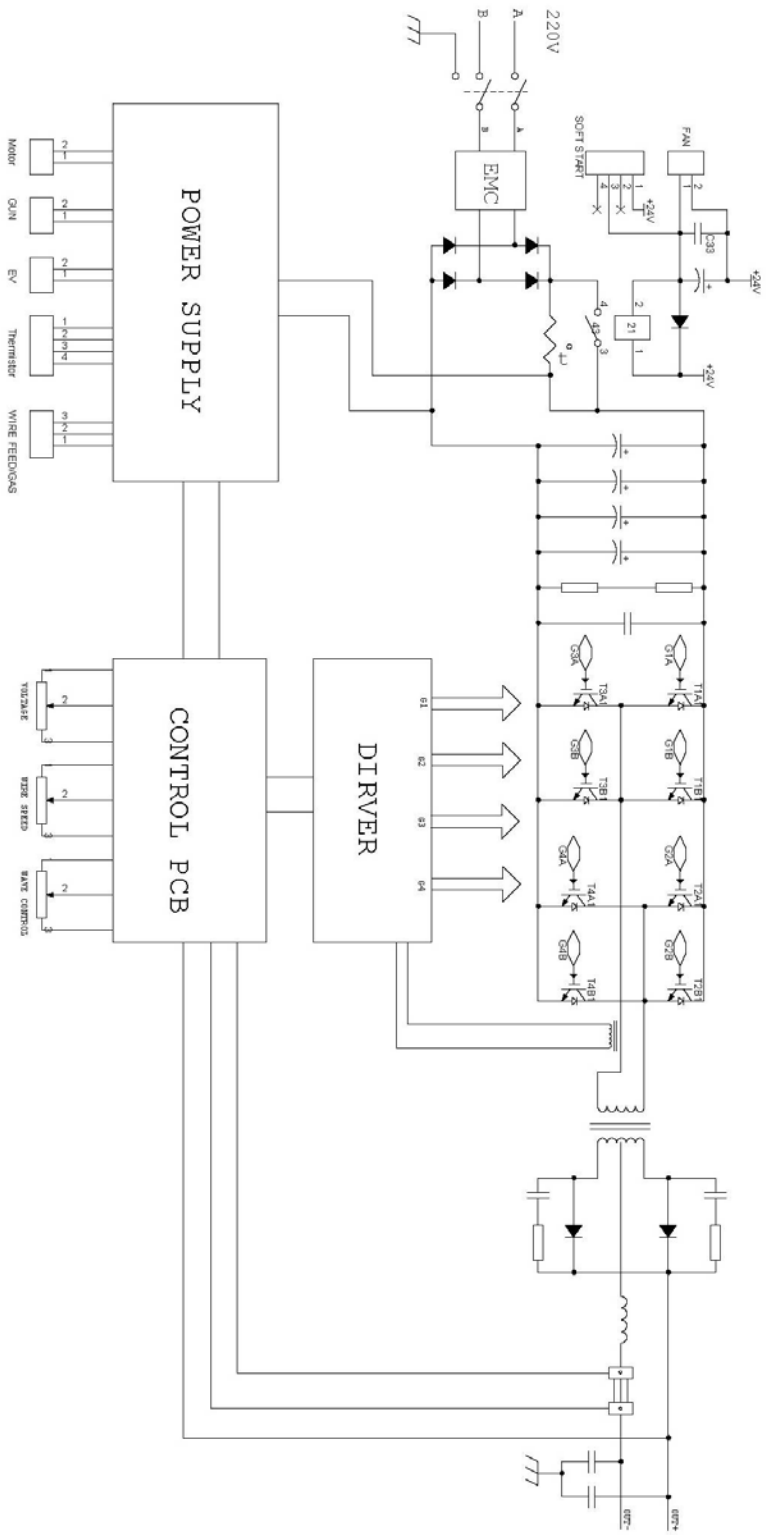
Hot parts can lead to burn

- Do not touch the hot parts.
- Please use the torch after cooling or use the welding blow lamp.
- The people with heart-pacemaker should be away from the welding arc.

Rotating parts may be dangerous

- Far away from rotating parts. (like fan)
- Keep the parts of machine in the safe position.

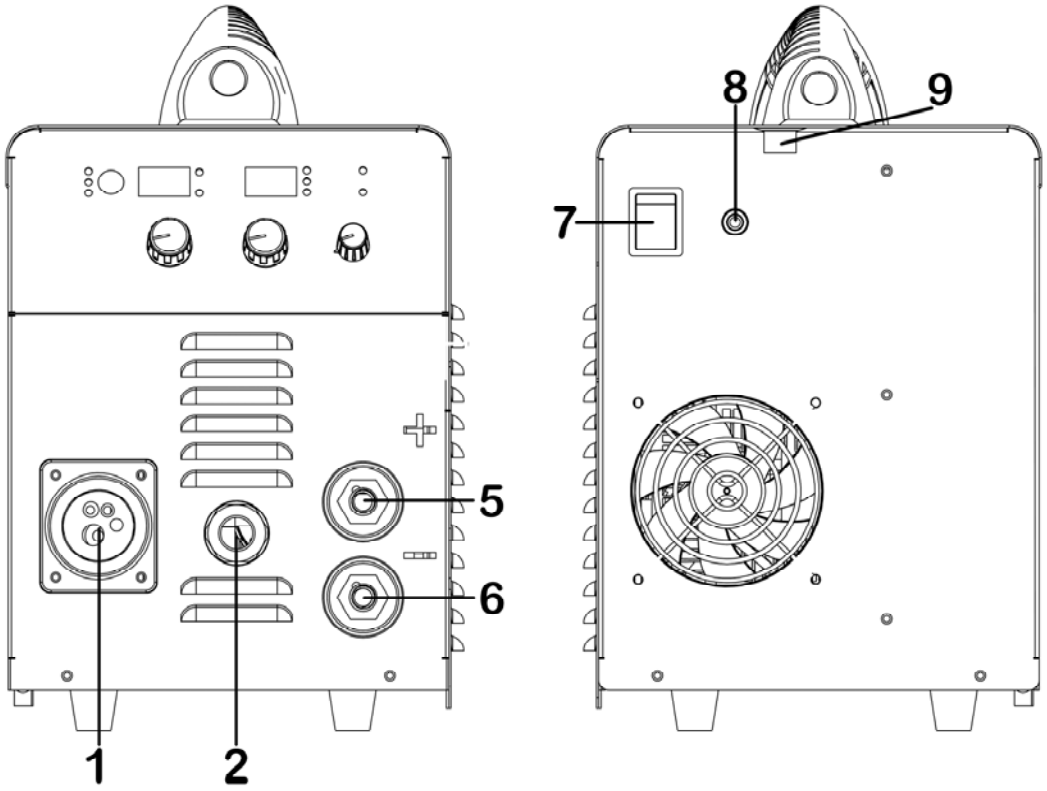
2. Electrical principle drawing



3. Specifications

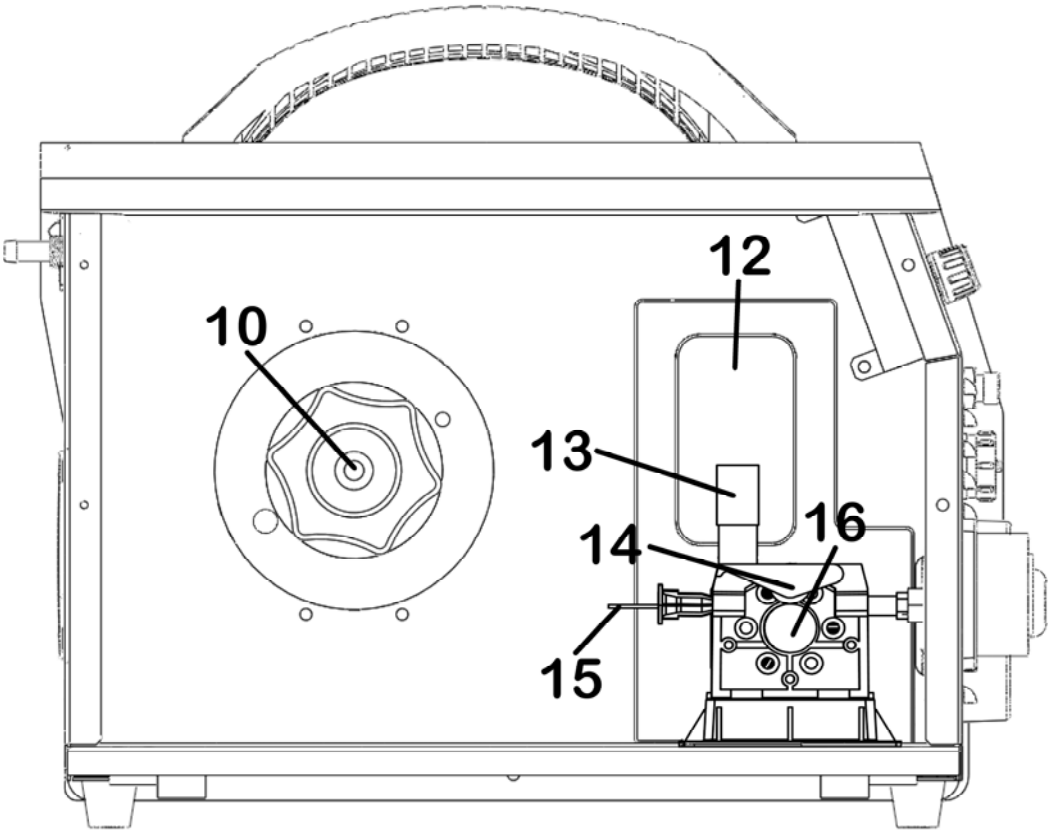
Parameters \ Models	MA200TS		
Process	MIG	TIG	STICK
Input Voltage（V）	208V/230V/±10%　single phase 60Hz		
Input Current（A）	37.5	29.5	44.5
Input Power（KW）	8.6	6.8	10.2
No-load Voltage（V）	67.5	67.5	69
Duty cycle（40℃）	20% 180A 60% 130A 100% 100A		
Welding Current Range (A)	40-200	10-180	10-180
Welding Voltage Range (V)	16-23	10.4-17.2	20.4-27.2
Wire Diameter(mm)	0.6、0.8、0.9 (steel /stainless steel/flux-cored)		
Protection class	IP21S		
Insulation class	H		
Dimensions（mm）	400*210*340		
Weight（Kg）	11.2		

4. Front and rear penal layout



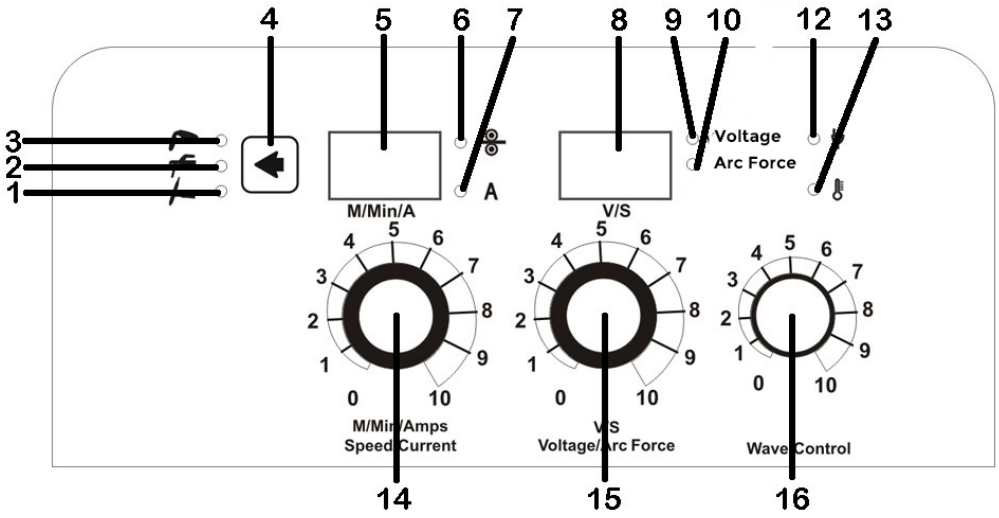
1. **Euro MIG torch connection:** connect to NT1 MIG torch.
2. **MIG Gun Polarity Lead: in MIG mode, connection positive output (+) is DCEP. Connect to negative output (-) is DCEN. (see installation diagram).**
3. Not applied in this model.
4. Not applied in this model.
5. **Positive output.**
6. **Negative output.**
7. **Power switch.**
8. **Gas inlet.**
9. **Power cord.**

5. Wire feeding layout



10. **Spool Holder** (2lb and 10lb spool).
11. Not applied in this model.
12. **Motor.**
13. **Pressure tensioner.**
14. **Pressure tension arm.**
15. **Wire inlet guide tube.**
16. **Drive roller.**

6. Control penal layout



1. **TIG mode indication light**.
2. **STICK mode indication light.**
3. **MIG mode indication light**
4. **Welding process selection button:** MIG | STICK | TIG
5. **Digital Wire speed/ current meter:** display preset wire feeding speed when arc-off, display actual welding current when arc-on.
6. **Wire speed indication light:** turn on when meter is displaying wire feed speed**.**
7. **Current indication light:** turn on when meter is displaying welding current**.**
8. **Digital Voltage/ arc force meter.**
9. **Welding voltage indication light:** turn on when meter is displaying welding voltage in MIG mode**.**
10. **Arc force light:** turn on when meter is displaying arc force in STICK mode**.**
11.
12. **Power LED:** Lights when input power connected and machine switched on.
13. **Alarm LED:** When the machine is over-heat or over-voltage, the light is on
14. **Left parameter knob:** Adjust current or wire feeding speed by rotating it.
15. **Middle parameter knob:** Adjust voltage or Arc force by rotating it.
16. **Inductance adjustment knob:** Set the Arc control (inductance) knob to a start value according to the voltage/wire feeding speed selection chart and you can adjust the knob during welding to obtain best result. Inductance is the rate of current response to a change in current. What this means is that when MIG welding with a short arc you can adjust how fast current is applied to the shorts. The less inductance you have the crisper the arc will appear and the wires will start easier. This will also make the bead taller and narrower. More inductance will make the

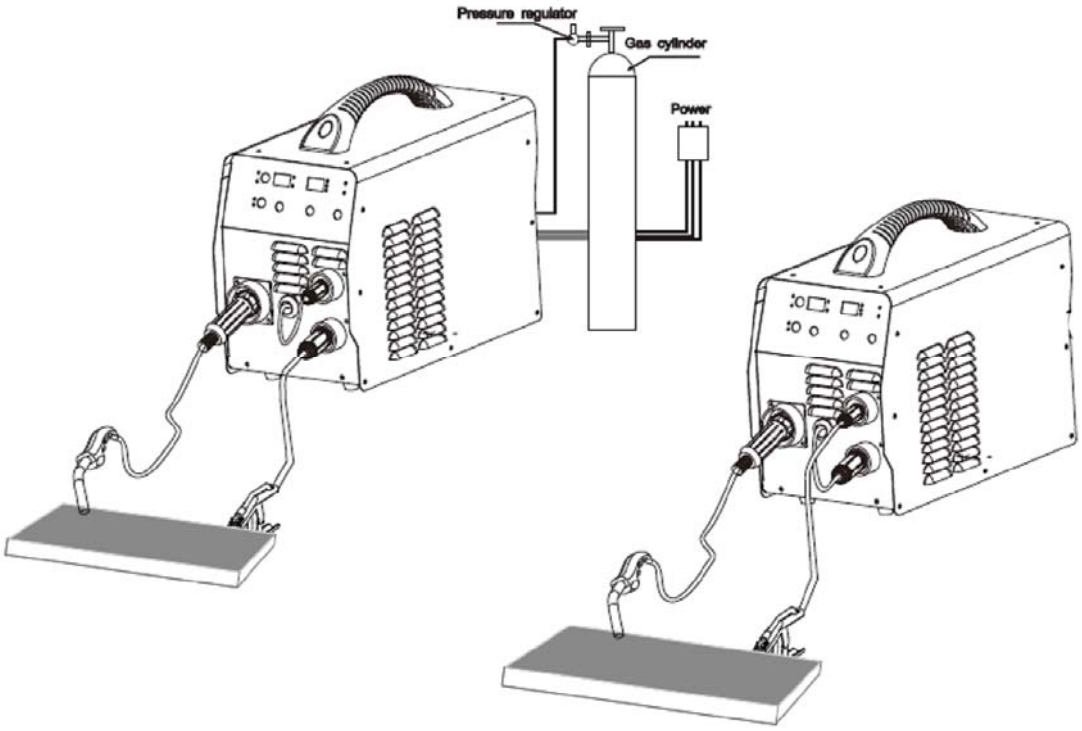
arc appear "softer" with a flatter wider appearance and if too much is used, wires will stumble during starts. Typically when short arcing steel only a little inductance is used in order to get a crisp arc. Low thermal conductivity materials such as stainless need more inductance to get acceptable wetting when short arcing.

7. Installation & Operation

The equipment protection level is IP23. Do not use in the rain!

The equipment must be turn off during installation!

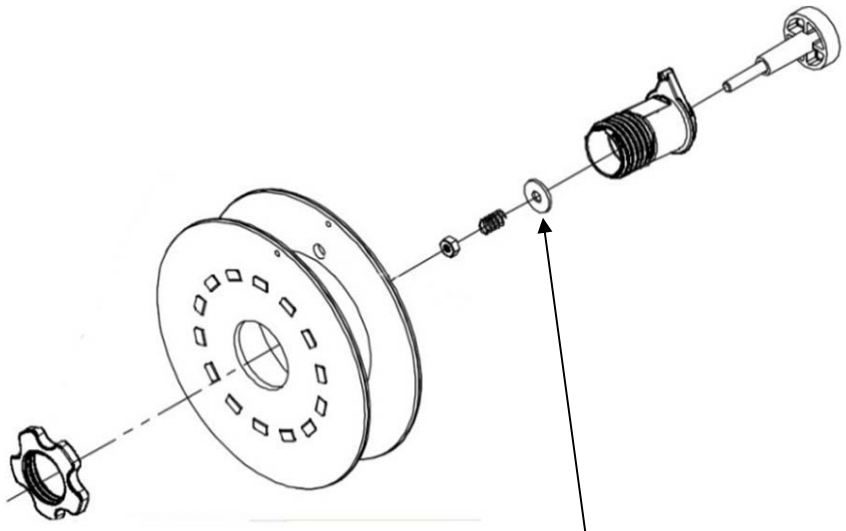
MIG welding installation diagram



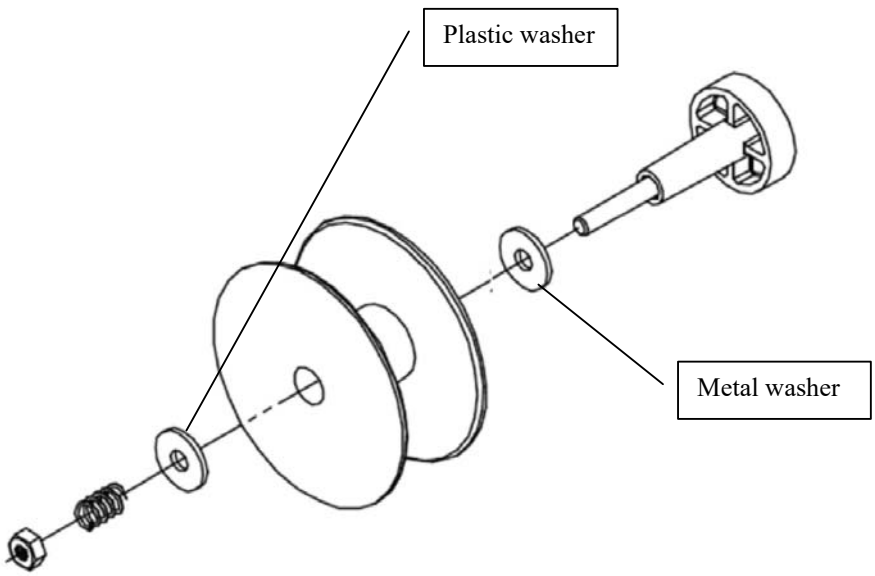
DCEP for steel, stainless steel and aluminum wire.
MIG Gun Polarity Lead must connect to positive output (+)

DCEN for flux cored wire.
MIG Gun Polarity Lead must connect to negative output (-)

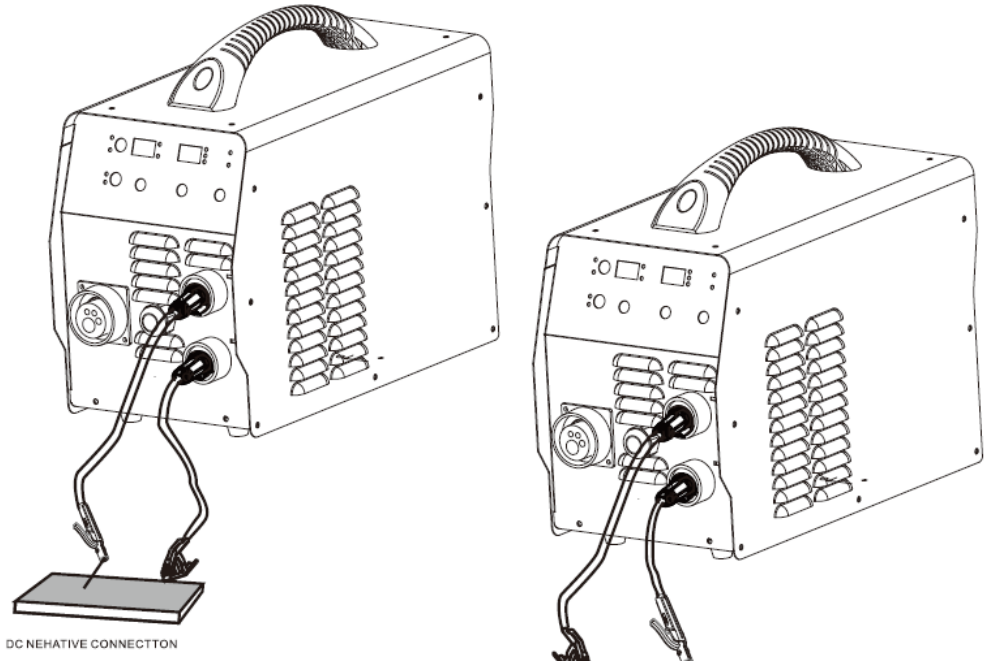
Installing 8" (200mm) Diameter Spool



Installing 4" (100mm) Diameter Spool



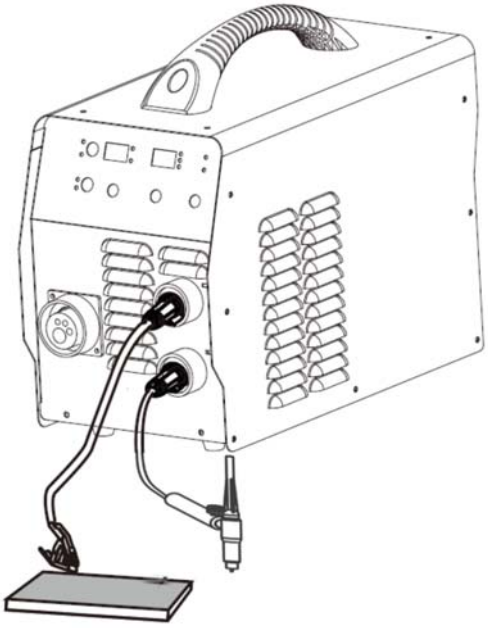
Stick welding installation diagram



DCEP

DCEN

TIG welding (lift TIG) installation diagram



5.1. Electric service guide

Input voltage(V)	208	230
Frequency(Hz)	60	60
Input Amperes at rated output(A)	37	34
Max recommended standard fuse Rating in Amp **Circuit breaker, time delay** **Normal operation**	 40 50	 40 50
Min input conductor size in AWG	14	14
Min Grounding conductor Size in AWG	10	10

5.2. Installation

- Welding machine should be installed in a stable position and with good ventilation. Avoid direct sun outdoors or rain. Place at a distance of 12" (300mm) or more from walls or similar that could restrict natural air flow for cooling. Avoid transport in invert or side position.
- Tightly connect the power cable to electrical socket outlet (refer to "technology parameters" for the input voltage)
- connect the compress air hose to the air supply equipment and the earth cable to the workpiece.
- Switch the ON/OFF Switch (located on the rear panel) to OFF.
- Connect NT1 MIG torch euro connection and earth cable to negative connection. Connect the control plug to the control receptacle at machine.
- Connect the gas to the gas inlet locate on rear penal.
- Install wire spool.
- Commission the machine after the machine is installed and tested:
- Release the pressure roller in the wire feeder, press the torch switch, and adjust voltage switch from low to high, Open circuit voltage should rise.
- Evenly adjust the current knob, the wire feed speed should increase evenly.
- Check the connection of work piece, earth cable, welding torch, gas cylinder, regulator and hose, make sure they are firm and reliable. Attach earth clamp as close as possible to the cutting portion. Do not attach earth cable to the portion that will fall away.

5.3. Recommended welding parameters

Note: The following table applies to low-carbon steel, other materials, please refer to related information.

MA200TS PARAMETER SELECTION CHART

KickingHorse®
WELDING INVERTER FOR HOME

-: setting not recommended.
The setting in the following chart is just for start only and can be fine tune during welding.
Wire feed speed ∅ ⟶ 200/19 ⟵ Voltage "V"

MIG/MAG WELDING	Polarity setting: MIG ┤ DCEP, Flux Core - DCEN. Shield gas for steel: 80% Ar, 20% CO2. Stainless steel and Al: 100% Ar.										
Material	**Steel**						**Stainless steel**			**Aluminum**	
Wire type	Solid ER70S-6			Flux core E71T-1			ER308,ER308L,ER 308LSi			ER4043	
Wire size (in) (mm)	0.023" 0.6	0.035" 0.9	0.045" 1.2	0.023" 0.6	0.030" 0.8	0.035" 0.9	0.023" 0.6	0.030" 0.8	0.035" 0.9	0.030" 0.8	0.035" 0.9
1/4" (6.4mm)	-	420/22	400/21.5	-	300/21	280/21	-	450/22.5	420/22	420/20	400/19.5
3/16" (4.8mm)	450/22	380/21.5	360/21	280/20.5	250/20	240/20	420/21	370/20.5	360/20	380/19	360/18.5
1/8" (3.2mm)	380/20.5	350/20	320/20	250/20	230/19.5	200/19	360/20	350/19.5	330/19	350/18.5	330/18
14ga. (2.0mm)	280/19.5	270/19	260/19	160/19	150/18.5	100/18.5	250/19	230/18.5	220/18	240/17.5	220/17
16ga. (1.6mm)	220/18.5	200/18	190/18	80/17.5	70/17	-	200/18	180/17.5	160/17	-	-
18ga. (1.2mm)	150/16.5	140/16	120/16	-	-	-	140/16	120/16	110/16	-	-
20ga (0.9mm)	80/15	70/15	65/14.5	-	-	-	75/15	70/15	-	-	-
22ga. (0.8mm)	60/14.5	50/14.5	50/14.5	-	-	-	55/14.5	-	-	-	-

STICK WELDING		Polarity setting: DCEP(Electrode positive), DCEN(Electrode negtive). Shield gas: no			
Material	**Electrode selection**	**Material thickness -->**	**3/16" (4.8mm)**	**1/8" (3.2mm)**	**16ga. (1.6mm)**
Mild Steel	**6103**	**Electrode dia (in)**	1/8	1/8	1/16
		Amperage(A)	120	100	60
	7018	**Electrode dia (in)**	1/8	1/8	1/16
		Amperage(A)	130	110	60
Stainless steel	**316**	**Electrode dia (in)**	1/8	3/32	1/16
		Amperage(A)	100	60	40

TIG WELDING Polarity setting: DCEN. Shield gas100% Ar			Material Thickness						
Mild steel & Stainless steel	**Tungsten Diameter**	**Filler Rod (if required)**	**1/4" (6.4mm)**	**3/16" (4.8mm)**	**1/8" (3.2mm)**	**16ga. (1.6mm)**	**18ga. (1.2mm)**	**22ga. (0.8mm)**	**24ga (0.6mm)**
Amperage(A)	**0.040"(0.8mm)**	**1/16"(1.6mm)**	-	-	-	-	30	30	25
	1/16"(1.6mm)	**1/16"(1.6mm)**		1st layer:100 2nd layer:125	90	60	35	30	25
	3/32"(2.4mm)	**3/32"(2.4mm)**	1st layer:125 2nd layer:150	1st layer:100 2nd layer:125	100	-	-	-	-
	1/8"(3.2mm)	**1/8"(4.0mm)**	1st layer:140 2nd layer:180	1st layer:125 2nd layer:140	125	-	-	-	-

6. Safety precaution

6.1.Installation precaution

(1) Welding environmental temperature should be between -10℃ to 40℃.

(2) The air humidity of not more than 90%.

(3) Avoid environment containing dust or corrosive gas.

(4) Avoid sunlight or rain; do not let water into the welding machine.

(5) Avoid the strong wind environment.

6.2.Safety

Refer to the American National Standard Z49.1 entitled: SAFETY IN WELDING AND CUTTING. **ALL INSTALLATION, OPERATION, MAINTENANCE, AND REPAIR WORK MUST BE PERFORMED BY QUALIFIED PERSONAL.**

(1) Welders must be equipped with welding mask, gloves and tie the sleeves and collar properly. Use Table 6.4 to choose proper glass shade, also can reference to ANSI Z49.1 listed in Safety Standards. There should be an arc shield around welding field to protect others from arc shock.

(2) Do not weld near flammable, explosive materials or gases.

(3) Keep finger, hair and clothing away from the rotating fan.

(4) The power source must be grounded when welding.

(5) When protection light is enlightened during welding, it is indicating that the welder is over current or over heat, and automatic protection will be triggered. Stop welding immediately and wait until welder cool down.

(6) Welding machine should not work in a flammable and toxic environment, avoid moisture, rain, and do not directly expose to sun.

(7) Do not switch off the welder during welding!

(8) Periodically maintain the machine and clean the dust inside.

7. Maintenance

Periodic maintenance is necessary for keeping the machine work properly.

WARNING

There are extremely dangerous voltage and power levels present inside this unit. Do not attempt to diagnose or repair unless you have had training in power electronics measurement and troubleshooting techniques. DISCONNECT POWER INPUT AND SWITCH OFF THE MAIN POWER SWITCH BEFORE START OF MAINTENANCE.

Regular Check and Inspection	6 Month Routine Maintenance
• Replace unreadable labels. • Clean spatter inside the nozzle when continuously use the machine • Check and change broken parts in the torch to	• Blow out with dry clean pressure air or vacuum inside machine, especially transformer coil and power component. • Check the electric connection of input/output bar to avoid bad contact caused by loose or rusted

avoid damage to the torch and machine. • Check the function of all switches. • Check if the fan rotates properly and if there is air venting out from back of the machine. • Pay Attention to the abnormal vibration, noise, smell and gas leakage during operation. • Check if the welding cables are over heated. • Check if the cable connections are over heated. • Check if the cable is connected firmly and properly, if it is broken and cause bad insulation. • Check the cover grounded properly.	screw. • Check the contactors and relays in the machine or on the PCB work properly. • Calibrate the current meter. • Check the resistance between machine case and main circuit, if the value is smaller than 1MΩ, sent the machine to an authorized warranty depot to inspect and repair immediately.

8. Troubleshooting & Service

The following operations require the operator has sufficient electrical expertise and comprehensive safety knowledge, the operator can demonstrate its capacity to be held valid qualifications and knowledge Documents.

Common Faults and exclusion method:

NO.	Troubles		Reasons	Solution
1	Close the breaker, but the power light isn't on		Breaker damaged	Change it
			Fuse damaged	Change it
			Power damaged	Change it
2	After welding machine is over-heat, the fan doesn't work		Fan damaged	Change it
			The cable is loosen	Screw the cable tightly
3	Press the gun switch, no output shielded gas	No output gas when test gas	No gas in the gas cylinder	Change it
			Gas pipe leaks gas	Change it
			Electromagnetic valve damaged	Change it
		Output gas	Control switch damaged	Repair the switch

		when test gas	Control circuit damaged	Check the board
4	Wire-feeder doesn't work	Wire reel doesn't work	Motor damaged	Check and change it
			Control circuit damaged	Check the board
		Wire reel works	The press wheel is loosen or weld wire skids	Press it tightly again
			The wheel doesn't fit with the diameter of weld wire	Change the wheel
			Wire reel damaged	Change it
			Wire feed pipe is jammed	Repair or change it
			Tip is jammed because of splash	Repair or change it
5	No striking arc and no output voltage		Output cable is connected mistakenly, or loosen	Screw it down or change it
			Control circuit damaged	Check the circuit
6	Welding stops, and alarm light is on		Machine has self-protection	Check over-voltage, over-current, over-temperature, lower-voltage and over-temperature, and solve it
7	Welding current is run away and can be not controlled		The potentiometer damaged	Check or change it
			The control circuit damaged	Check the circuit
8	The crater current can be not adjusted		The PCB damaged	Check it
9	No post-gas		The PCB damaged	Check it

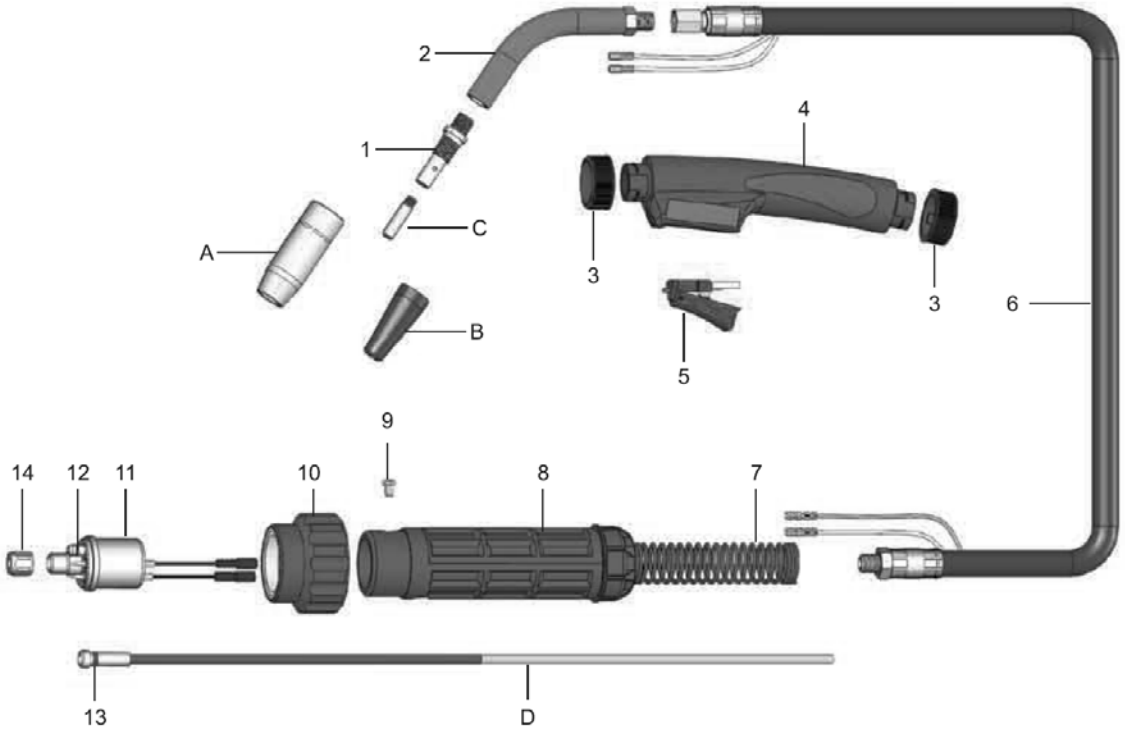
List of error code

Error Type	Error code	Description	Lamp status
Thermal relay	E01	Over-heating (1st thermal relay).	Yellow lamp (thermal protection) always on.
	E02	Over-heating (2nd thermal relay).	Yellow lamp (thermal protection) always on.
	E03	Over-heating (3rd thermal relay).	Yellow lamp (thermal protection) always on.
	E04	Over-heating (4th thermal relay).	Yellow lamp (thermal protection) always on.
	E09	Over-heating (Program in default).	Yellow lamp (thermal protection) always on.
Welding machine	E10	Phase loss.	Yellow lamp (thermal protection) always on.
	E12	No gas.	Red lamp always on.
	E13	Under voltage.	Yellow lamp (thermal protection) always on.
	E14	Over voltage.	Yellow lamp (thermal protection) always on.
	E15	Over current.	Yellow lamp (thermal protection) always on.

	E16	Wire feeder over load.	
Switch	E20	Button fault on operating panel when switch on the machine.	Yellow lamp (thermal protection) always on.
	E21	Other faults on operating panel when switch on the machine.	Yellow lamp (thermal protection) always on.
	E22	Torch fault when switch on the machine.	Yellow lamp (thermal protection) always on.
	E23	Torch fault during normal working process.	Yellow lamp (thermal protection) always on.
Accessory	E30	Cutting torch disconnection.	Red lamp blink.
Communication	E40	Connection problem between wire feeder and power source.	
	E41	Communication error.	

9. Torch Part Breakdown

KickingHorse® NT1-3E, Order No. KAM31003



Nozzles

Item	Description	Order No.	
1	Nozzle Self Insulated	21-37	A
2	Nozzle Self Insulated	21-50*	A
3	Nozzle Self Insulated	21-62	A
4	Nozzle Self Insulated	21-37F	A
5	Nozzle Self Insulated	21-50F	A
6	Nozzle Self Insulated	21-62F	A
7	Nozzle Self Shielding	LA8201	B

Contact Tips

Item	Description	Order No.	
1	Contact Tip 0.023”/0.6mm Ecu	11-23	C
2	Contact Tip 0.030”/0.8mm Ecu	11-30	C
3	Contact Tip 0.035”/0.9mm Ecu	11-35*	C
4	Contact Tip 0.040”/1.0mm Ecu	11-40	C
5	Contact Tip 0.045”/1.2mm Ecu	11-45	C

Liners

ITEM	DESCRIPTION	ORDER NO.	
1	Steel Liner 0.030”-0.035”/0.8-0.9mm X15ft	42-3035-15*	D
2	Teflon Liner 0.035”-0.045”/0.9-1.2mm X15ft	42T-3545-15	D

* Default

Component

ITEM	DESCRIPTION	PART No.
1	Gas Diffuser	51
2	Goose neck(45°)	61-45
	Goose neck(55°)	61-55
3	Handle locking Nut	EH1111
4	Gun Handle (Front)	EH1101
5	Trigger Assembly	EJ0003
6	Gun &Cable Assembly 3M	TEL1030
7	Rear spring cable support	ES2201
8	Gun plug housing	EH2201
9	Screw(M4X6)	EH2211
10	Rear lock nut	EP2001
11	Euro connector(Tweco)	ETU001
12	O ring 4x1	Q504010
13	O ring 4x8	Q504018
14	Nut M11X1	TEU1011

NOTES

MA200TS MIG/STICK/TIG multi-process welder

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