

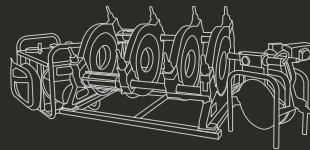


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HDPE Butt Fusion Welding Machine

TW160MAC-TW800MAC

MAC Hydraulic Series



TEH



TECHNICAL DATA

Model	Input Power Voltage (V)	Heater Plate Temperature (°C)	Heater Plate Power (W)	Electric Planer Power (W)	Hydraulic Equipment (W)	Pipe Diameter (mm)	Fusing Type
TW160MAC	AC: 220	0-300°C	1600	900	750	(40)63-160	Butt welding
TW200MAC	AC: 220	0-300°C	2000	900	750	63-200	Butt welding
TW250MAC	AC: 220	0-300°C	2500	1200	750	(63)90-250	Butt welding
TW315MAC	AC: 220	0-300°C	3000	1200	750	(90)160-315	Butt welding
TW355MAC	AC: 220	0-300°C	3500	1200	750	(90)160-355	Butt welding
TW400MAC	AC: 380	0-300°C	5100	1500	1100	200-400	Butt welding
TW450MAC	AC: 380	0-300°C	5200	1500	1100	(180)280-450	Butt welding
TW500MAC	AC: 380	0-300°C	8000	1500	1100	(180)280-500	Butt welding
TW630MAC	AC: 380	0-300°C	9200	1500	1100	(315)400-630	Butt welding
TW800MAC	Ac: 380	0-300°C	12800	1500	1100	(450)630-800	Butt welding

PRODUCT STRUCTURE

The MAC series welding machine comprises the machine, electric planer, heater plate, storage box, aluminum clamp adaptor sets and hydraulic pump station.

1.Machine

*Pedestal

*The max. aluminum clamps device set up on the pedestal.
(two clamp devices are fixed, two clamp devices are movable)

*Hydraulic oil cylinder

*Adaptor aluminum clamps sets

2.Electric planer

*Body

*Electric Motor (or hydraulic motor)

*Swivel Cutter head & blade

3.Heater assembly

*Heater Plate with teflon coating

*Handle

4.Storage box for planer and heater plate

5.Aluminum clamp adaptor sets with box

6.Hydraulic Pump Station

* Hydraulic assembly

*electrical system control box

OVERVIEW

The MAC series plastic pipe butt welding machine is an electro-hydraulically powered welder for joining plastic pipe including PPR and HDPE. It is convenient to operate, incorporates a state-of-the-art heat plate and provides excellent results.

TIPS BEFORE USING

1. The MAC series butt welding machines are intended for operation in workshops or construction sites and are suitable for pipe sizes between D50—D630 in PPR and HDPE material. This series of welder can accommodate butt fusion.
2. Please read this operation manual carefully to ensure safe operation of the machine. The DHJ range complies with the Safety Standard EN60335-2-45:2002. Please ensure the machine is operated in accordance with the instructions in this manual to prevent safety and/or machine life being compromised.
3. This welder must be operated by a qualified operator.

WELDING INSTRUCTIONS

1. THERE ARE SIX BASIC STEPS

- 1.1 Facing: Plane pipe ends to be clean and parallel.
- 1.2 Bead up: Apply weld pressure to pipes against heater plate to “bead up” pipe. This ensures perfect contact with the heater plate and a basis for heat absorption. The size of the bead created is commensurate with pipe outside diameter.

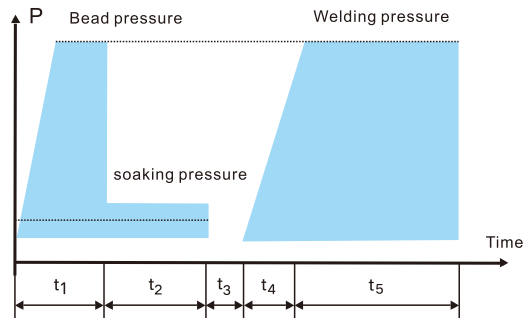
1.3 Heat absorption: pipes are held against the heater plate for a specific pressure/time. This is usually referred to as “heat soak”.

1.4 Remove Heat Plate: Remove the heater plate. This step must be performed as quickly as possible to avoid “cold welds” or contamination (by oxidization or dust/etc.). This is usually referred to as “changeover”.

1.5 Fusion: Join the two ends of pipe and apply weld pressure (refer to section 5 below). And Please defer to the time parameters from your pipe supplier.

1.6 Cooling: After fusion is accomplished, a “cool down” period is required. The joint must not be disturbed in any way during cool down. All movement or stress is to be avoided.

2. TIME CURVE FOR HEATING, CHANGEOVER, HEAT SOAK AND COOL DOWN.



Wall thickness (mm)	Bead height (mm)	Bead build-up pressure (MPa)	Soaking time t_2 (sec)	Soaking pressure (MPa)	Change-over time t_3 (sec)	Pressure build-up time t_4 (sec)	Welding pressure (MPa)	Cooling time t_5 (min)
0~4.5	0.5	0.15	45	≤0.02	5	5	0.15 ± 0.01	6
4.5~7	1.0	0.15	45~70	≤0.02	5~6	5~6	0.15 ± 0.01	6~10
7~12	1.5	0.15	70~120	≤0.02	6~8	6~8	0.15 ± 0.01	10~16
12~19	2.0	0.15	120~190	≤0.02	8~10	8~11	0.15 ± 0.01	16~24
19~26	2.5	0.15	190~260	≤0.02	10~12	11~14	0.15 ± 0.01	24~32
26~37	3.0	0.15	260~370	≤0.02	12~16	14~19	0.15 ± 0.01	32~45
37~50	3.5	0.15	370~500	≤0.02	16~20	19~25	0.15 ± 0.01	45~60
50~70	4.0	0.15	500~700	≤0.02	20~25	25~35	0.15 ± 0.01	60~80

Remark: Bead build-up pressure and welding pressure in the form is the recommended interface pressure, the gauge pressure should be calculated with the following formula.

Expressions:

$$\text{welding pressure} = \frac{\text{Section of welding pipe ends}}{\text{Total section of cylinders}} \times 0.15 + \text{drag pressure (MPa)}$$

REFERENCE TABLE FOR WELDING DIFFERENT SIZE OF PIPES

Table 2: Fusing Pipes for Water Supplying Pipe(HDPE100) (Rated Pressure 0.6Mpa)

Specs φ	Pipe Wall Thickness	Heat Plate Temperature	Bead Height	Heating		Heat Absorbing		Shift Time Less Than	Connection		Cooling	
				Pressure	Time	Pressure (plus drag)	Time		Pressure	Time	Pressure	Time
(mm)	(mm)	(°C)	(mm)	(Mpa)	(S)	(Mpa)	(S)	(S)	(Mpa)	(S)	(Mpa)	(mm)
50	1.9	210 ± 5	0.7	0.06	6	0.01	23	5	0.06	5	0.06	5
63	2.4	210 ± 5	0.7	0.09	7	0.01	29	5	0.09	5	0.09	6
75	2.9	210 ± 5	0.8	0.14	8	0.02	35	5	0.14	6	0.14	6
90	3.5	210 ± 5	0.8	0.20/0.16	9	0.03/0.02	42	6	0.20/0.16	6	0.20/0.16	7
110	4.2	210 ± 5	0.9	0.29/0.23	10	0.04/0.03	50	6	0.29/0.23	6	0.29/0.23	7
125	4.8	210 ± 5	1.0	0.37/0.30	11	0.05/0.04	58	6	0.37/0.30	6	0.37/0.30	8
140	5.4	210 ± 5	1.0	0.47/0.38	12	0.06/0.05	62	6	0.47/0.38	7	0.47/0.38	8
160	6.2	210 ± 5	1.1	0.62/0.5	15	0.08/0.07	74	6	0.62/0.5	7	0.62/0.5	9
180	6.9	210 ± 5	1.2	0.62	18	0.08	83	7	0.62	7	0.62	10
200	7.7	210 ± 5	1.3	0.77	20	0.1	92	7	0.77	8	0.77	11
225	8.6	210 ± 5	1.5	0.97	21	0.12	103	7	0.97	8	0.97	12
250	9.6	210 ± 5	1.5	1.2	25	0.16	115	7	1.2	8	1.2	13
315	12.1	210 ± 5	1.5	1.9/0.86	28	0.25/0.13	145	8	1.9/0.86	9	1.9/0.86	15

355	13.6	210±10	2	/1.09	35	/0.16	163	8	/1.09	9	/1.09	17
400	15.3	210±10	2	/1.39	45	0.2	184	9	/1.39	10	/1.39	18
450	17.2	210±10	2.5	0.51	66	0.08	206	9	0.51	11	0.51	20
500	19.1	210±10	3	0.63	72	0.1	229	10	0.63	12	0.63	22
560	21.4	210±10	3	0.79	83	0.13	257	11	0.79	13	0.79	24
630	24.1	210±10	4	1.00	95	0.17	289	11	1.00	14	1.00	27

Table 3: Welding Pipes for Water Supplying Pipe(HDPE100)
(Rated Pressure 0.8Mpa).

Specs φ	Pipe Wall Thickn ess	Heat Plate Tempe rature	Bead Heig ht	Heating		Heat Absorbing		Shift Time Less Than	Connection		Cooling	
				Press ure	Time	Pressure (plus drag)	Time		Press ure	Time	Press ure	Time
(mm)	(mm)	(°C)	(mm)	(Mpa)	(S)	(Mpa)	(S)	(S)	(Mpa)	(S)	(Mpa)	(mm)
50	2.4	210±5	0.7	0.07	6	0.01	29	5	0.07	5	0.07	5
63	3.0	210±5	0.8	0.12	7	0.02	36	5	0.12	5	0.12	6
75	3.6	210±5	0.9	0.17	8	0.02	43	5	0.17	6	0.17	7
90	4.3	210±5	0.9	0.24/0.19	9	0.03/0.02	52	5	0.24/0.19	6	0.24/0.19	7
110	5.3	210±5	1.0	0.36/0.29	10	0.05/0.04	64	6	0.36/0.29	6	0.36/0.29	8
125	6.0	210±5	1.1	0.46/0.37	11	0.06/0.05	72	6	0.46/0.37	6	0.46/0.37	9

140	6.7	210±5	1.2	0.58/0.47	12	0.08/0.06	80	6	0.58/0.47	7	0.58/0.47	10
160	7.7	210±5	1.3	0.76/0.61	15	0.1/0.08	92	6	0.76/0.61	7	0.76/0.61	11
180	8.6	210±5	1.4	0.77	18	0.1	103	7	0.77	8	0.77	12
200	9.6	210±5	1.5	0.95	20	0.13	108	7	0.95	8	0.95	13
225	10.8	210±5	1.6	1.21	21	0.16	130	7	1.21	8	1.21	14
250	11.9	210±5	1.7	1.48	25	0.2	143	8	1.48	9	1.48	15
315	15.0	210±5	2.0	2.34/1.1	28	0.31/0.15	180	9	2.34/1.1	10	2.34/1.1	18
355	16.9	210±10	2.2	/1.35	35	0.18	203	9	/1.35	11	/1.35	20
400	19.1	210±10	2.4	/1.7	45	0.23	229	10	/1.7	12	/1.7	22
450	21.5	210±10	2.7	0.63	66	0.08	258	10	0.63	13	0.63	25
500	23.9	210±10	2.9	0.78	72	0.1	287	11	0.78	14	0.78	27
560	26.7	210±10	3.2	0.98	83	0.13	320	12	0.98	15	0.98	30
630	30.0	210±10	3.5	1.23	95	0.16	360	13	1.23	16	1.23	33

NOTE ▲

1. The above parameters are based on an ambient temperature under 20°C. If the temperature or pressure is significantly different or strong winds are encountered, please adjust the parameters or apply a suitable protection method. This table is for reference only. Please defer to the parameters from your pipe supplier.

2. The heating time only for reference. It would be better refer to the data of bead height and the hot crimping effect.

OPERATION INSTRUCTIONS

1.WELDING REQUIREMENTS

a)The pipes to be welded must have physical/chemical characteristics which allow them to be fusing. This data must be provided and certificated by your pipe suppliers. Both pipes to be joined must have the same outside diameter and wall thickness.

b)The following conditions must exist:

In muddy, dirty, strong wind or low temperature environments, please use a tent for protection.

A tent should also be used for high ambient temperature areas.

For cold area, increase heater plate temperatures up to 20 degrees C above normal.

The pipe ends to be welded must be clean.

The pipe ends to be welded must have same temperature (Avoid strong sunlight).

During welding (especially during cool down), avoid any collision or stress to the weld.

The open ends of pipes to be welded must be covered to avoid wind blowing into pipes.

Place the pipes on pipe supports to reduce drag.

2.WELDING PRINCIPLE

The basic principle is to apply both pipe ends to be close to a heater plate. Once enough “heat sink” has occurred, take out the heater plate. The pipe ends are fusing together at a specific pressure and held immobile until completely cooled.

3.OPERATING METHOD

NOTE ▲

Preheat heater plate and allow to stabilize prior to welding.

3.1 Install suitably-sized clamps into welder. Insert pipes and secure. Check alignment and adjust if necessary (make sure enough room is available for planer between pipe ends).

3.2 Install the electric planer on the welder with safety lock. Turn on the hydraulic pump, turn the pressure regulator valve clockwise to P0 pressure, use the direction valve to move the pipe together, then switch on the electric planer to start cutting the oxidized surface of the pipe be welded with minimum pressure (Maximum cutting thickness is 0.5mm). Ensure the pipe ends are parallel (max tolerance <0.3mm), Pipe alignment tolerance is under 0.5mm.

Note: Pipe ends and heater plate must be completely clean prior to commencing a weld.

3.3 Take out the planer, insert the heater (preheated to designated temperature as above), press the pipe ends onto the heater plate with required pressure. Maintain pressure until a suitable bead-up is achieved. After bead-up turn the direction valve to stop. The pressure will drop to the heat-soak parameter. Once the calculated heat-soak is complete, immediately remove the clamps and take out the heater plate. The heated pipe surfaces must be joined immediately (see changeover parameter).

3.4 Use the direction valve to make the pipe ends reach the rated welding pressure quickly, the pressure must remain stable once achieved. Do not over-pressure!

3.5 During cooling, switch off the pump power and maintain the welding pressure. Avoid cooling or moving the weld suddenly. Beads should be even and consistently sized.

* Please record this information when welding.

- Operator ' s name and Company.
- Machine ' s model and serial number.

- Current ambient temperature and weather conditions.
- Pipe diameter, wall thickness and resin type.
- Weld parameters.

SAFETY ALERTS – WARNING AND NOTICE

To avoid accident during operation, you must operate and transport this machine carefully. Always following the instructions according to this operator ' s manual and obey safety rules.

In order to keep the machine in a safe and efficient working condition, you must examine and maintain it regularly.

1. MACHINE CONNECTION REQUIREMENTS:

a. Power source connection

Construction and working site power equipment source must be in accord with IEC17-13/1 AND 7-13/4 standard. It must have a shock protect switch with a .2 second reaction time.

b. Connection cable between welder and power source

The welder must be connected by a cable which is strong enough to stand against mechanical impact and corrosion. If the cable length is longer than 100 meters, the diameter of the cable must be not smaller than 4 square millimeter diameter.

c. Grounding

The whole construction and working site needs a grounding device, grounding resistance must be suitable for the protection device, and ensure that any metal material voltage difference with the resistance is not over 25 V. Grounding resistance must be fixed and tested by a qualified person., and correctly marked to local regulations. That mean the machine require an effective earth & relevant standards.

d. Advice for using and keeping the equipment:

In order to reduce risk, all equipment must be used, transported and stored correctly. Avoid using temporary connections.

Do not attempt to touch or modify electrical components. Always isolate electrical comp onentry prior to performing any maintenance, cleaning or repairs.

Do not shut off the power by pulling the cable instead of the plug;

Do not use the power cable to move the machine.

The cable temperature must not exceed 70 degrees Celsius. Do not allow the cable to come into contact with sharp-edged objects.

Do not operate in wet or slippery conditions. Keep PPE in good condition and always keep the machine dry.

Do not use machine for heavier use than it is designed for. Always reduce drag to a minimum where possible.

Examine insulation and anti-shock device regularly.

Examine the grounding device regularly.

Avoid use in high temperatures, rain or thunderstorms.

Do not operate in the presence of flammable gasses or liquids.

Store the machine in a dry, secure place when not in use.

Always disconnect the machine after use (do not leave switched on).

2.PROPER WEAR

Do not wear loose clothes or decorations. They may become entangled in the machine and cause injury.

Operator must wear and use correct personal protection equipment (PPE).

3. SAFE OPERATION

Before starting the machine, check the machine power switch is in “ on ” position. All plugs are inserted securely into the relevant outlet. Check the pipes are properly placed and adjusted to the best position and fastened. Avoid operating in a dangerous work situation.

4. ENVIRONMENT REQUIREMENTS:

Keep the working ground tidy and clean.

Dirty and crowded work conditions are not only inefficient, but also cause accidents. It is also very important to place the equipment on a firm base to ensure quality welding and operator safety.

The machine must be operated by trained and qualified personnel. Examine the safety at work site before a visitor arrives.

Do not allow visitors access to areas where safety may be compromised.

This machine must not be operated by a non-qualified operator.

5. POSSIBLE SAFETY ISSUES:

- a) This equipment is to be operated by qualified personnel only, use of this equipment by non-qualified personnel can be dangerous to the operator or others..
- b) The heating plate can be heated up to 260C, so the following protection steps are necessary:
Operator must wear gloves and correct PPE.
Heating plate must be placed into the storage support after heating
After the heating plate is completely cooled, place the storage support in a suitable place with warning notice.
Never touch the heater plate faces.

c) Before planing, clean the pipe ends to prevent objects damaging the blades. Make sure the safety lock is fastened before commencing to plane. Always return the planer to the original storage place after planing.

Note: Never move the clamps while the planer is working.

d) Check the pipes are properly placed and secured to the machine to ensure quality welds

TROUBLESHOOTING

1.PLANER

Check the thickness of the cut by the planer (0.2mm or greater), check the blades are sharp. Paper shims can be used to adjust the depth of cut if necessary. Maximum depth of cut should be .5mm)

2.HEAT PLATE

Check the heat plate is working properly. The green light on the temperature control panel indicates heating; the lights will change to red when the temperature reaches the set temperature. Check the heat plate temperature regularly. Clean the heat plate surface with a clean cotton towel to protect the coating surface. If the coating surface is damaged, it must be repaired/replaced.

NOTE 

After the heat plate is connected to power, it can only be used after the temperature reaches rated temperature and remains stable.

3. MACHINE SUPPORT

- Check all components are in good order and moving freely
- Check accuracy of hydraulic pressure.
- Check correct clamps are in place and secured effectively.
- Check hydraulic oil level regularly. If below 70% full, please add 47# hydraulic oil.

4. TROUBLESHOTS AND SOLUTIONS

Troubles	Reason	Solution
Heat Plate is not heating	A. Power is off B. Power cord is damaged C. Control Panel is u/s D. Sensor is broken	A. Connect Power B. Change Heat Plate C. Change Control Panel D. Change Sensor
Heat Plate is too hot	A. Controlled Silicon in control system is over heat and broken B. Sensor is u/s C. Temperature controller is u/s	A. Change control silicon B. Change the broken point C. Change the temperature controller

Heat plate temperature is not stable.	A. Heat plate connector or screw is loose	A. Tighten the connector or screw
Planer doesn't work	A. Power is not correct B. Switch is not properly set C. Chain broken/off D. Electric motor u/s	A. Check the power B. Check the switch and fix C. Remount/replace chain D. Change the motor
Planer not cutting properly	A. Blades are too low B. Blades are not sharp	A. Adjust the level of the blades B. Sharpen or replace the blades
Hydraulic system leaking oil	A. Oil pipe connector is loose B. Gaskets u/s	A. Secure connector B. Replace gaskets
Electric Motor is not working	A. Wiring is damaged B. Plug, socket is not properly connected C. Motor is u/s	A. Change the wiring B. Check and connect properly C. Change/repair motor
Electric motor running slowly and the sound is not right	A. Capacitor is u/s B. Power supply is lower than rated input	A. Change the 2 capacitors B. Check the power input
Hydraulic Cylinder is not working	A. Valve switch is off or damaged/u/s B. Valve or oil pipe is blocked	A. Change valve B. Clean valve and oil pipe
Pressure gauge is inaccurate	A. Gauge is leaking oil or u/s	A. Secure or change gaskets B. change pressure gauge

WARRANTY CARD

Dear customers, the warranty service for purchasing TEH products is as follows:

Under normal use, within six months from the date of purchase. It is guaranteed that the damage is caused by the quality of the tool.

The following conditions occur during the warranty period, not covered by the warranty:

- a. Any valid legal document (single ticket) certifying the date of purchase
- b. Any damage caused by natural wear and overload
- c. Any damage caused by the use of low-priced inferior accessories
- d. Any damage caused by improper carrying, transportation or storage
- e. Any product that has been opened, repaired, replaced, or modified by itself
- f. Any damage caused by misuse, beyond the scope of use of the tool, and failure to use and maintain in accordance with the instructions

 ladies/gentlemen: _____ employer: _____

contact number: _____ fax number: _____

contact address: _____

warranty record: _____

post code: _____

IMPORTANT NOTE

1. The invoice and warranty card must be presented at the time of warranty.
2. The fuselage number on the invoice is the same as the fuselage number on the warranty card.
3. Once this warranty card is issued, if it is lost, it will not be reissued. Please keep it properly.

Note: The company reserves the right to amend the above provisions and has the final interpretation right in the case that the warranty service does not violate national laws.