



# Operator's Manual

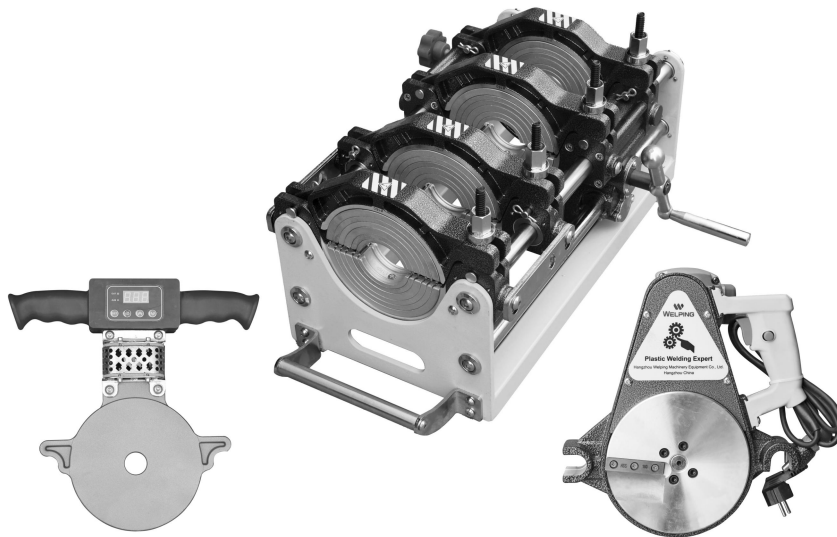
## Butt fusion welding machine

For Model: WP110C2

WP160C-200C

WP160C2-200C2

WP250C



### **WARNING!**

Read this Operator's Manual carefully before using the tool. Failure to understand and follow the instructions of this manual may result in electrical shock, fire and/or serious personal injury.

## Overview of Fusion operation

The operation of heat fusion is to heat two pipe end surfaces to a specified temperature, then fuse them together by application of certain force. This will develop pressure which causes flow of the melted material, which causes mixing and thus fusion. When the thermoplastic material is heated, the molecular structure is transformed into an amorphous condition. When fusion pressure is applied, the molecules from each thermoplastic part mix together. As the joint cools, the molecules return to the solid form, the original interfaces are gone, and the fitting and pipe have become one complete unit. A strong, fully leak-tight connection is the result.

### Major operations include:

<b>Clamping</b>	The pipes are held axially and radially for all subsequent operations to follow
<b>Planing</b>	The pipe ends are planed (trimmed, faced) to establish clean, parallel jointing surfaces perpendicular to the center line of the pipes
<b>Aligning</b>	The pipe ends are aligned with each other to minimize mismatch of the pipe walls.
<b>Heating</b>	A melt pattern that penetrates into the pipe is formed around both pipe ends
<b>Fusing</b>	The melted pipe ends are joined under specified force, which is constant around the pipe interfacial area.
<b>Cooling</b>	The fusion joint is held immobile under specified pressure until adequately cooled.
<b>Inspecting</b>	Visually examine the outlook of the joint for compliance with the standard or fusion procedure used.

## Thank you for choosing WELPING

The D series butt fusion machines allow operators to butt fuse pipe(PE, HDPE, PP, MPP, PVDF) in the thermoplastic piping jobs. With its compact design and optimal weight, it is an easy machine to operate when performing fusions in tight spaces as well as on the ground.

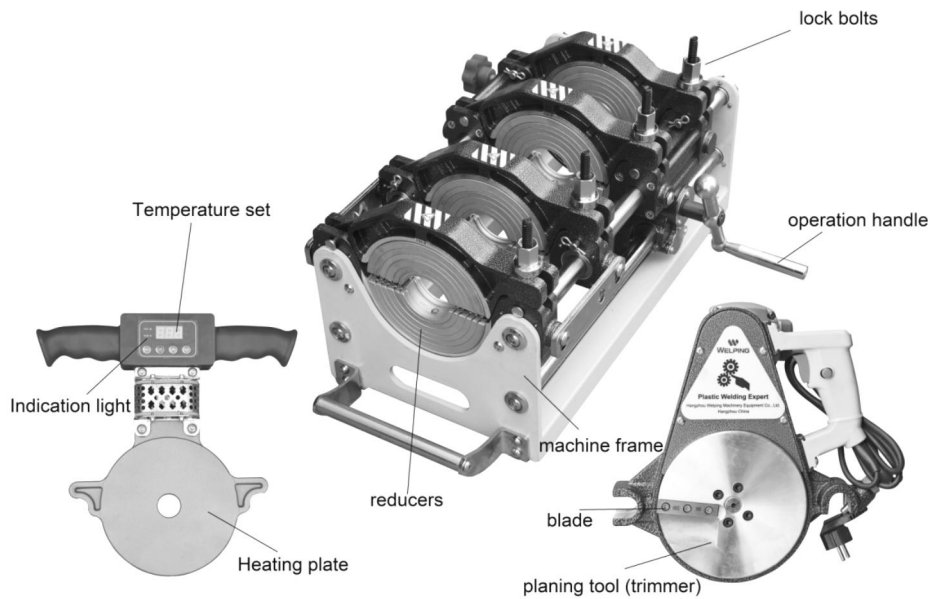
The D series machines feature complete welded frame, which provides overall rigidity, yet light-weight. Fine machined clamping sets present accurate pipe accommodation. Its cost and performance balanced tool for light duty pipe welding applications.

With reasonable care and maintenance, the machine will give years of satisfactory service. Before operating this machine, please read this manual thoroughly, and keep a copy with the machine for future reference.

When fusing thermoplastic pipe materials, refer to the pipe manufacturer's fusion procedures or appropriate joining standard.

Model	Fusion range (mm)	Standard reducers (mm)
WP110C2	40-110	40-50-63-75-90-110
WP160C/C2	63-160	(50) 63-75-90-110-125-140-160
WP200C/C2	63-200	63-75-90-110-125-140-160-180-200
WP250C	90-250	90-110-125-140-160-180-200-225-250

Sizes those are in (\*\*) are optional.



## Read and Understand

Do not operate this equipment until you have carefully read, and understand all the sections of this manual, and all other equipment manuals that will be used with it.

Your safety and the safety of others depends upon care and judgment in the operation of this equipment.

Follow all applicable local, and industry specific regulations.

WELPING cannot anticipate every possible circumstance that might involve a potential hazard. The warnings in this manual and on the machine are therefore not all inclusive.

You must satisfy yourself that a procedure, tool, work method, or operating technique is safe for you and others. You should also ensure that the machine will not be damaged or made unsafe by the method of operation or maintenance you choose.

## General Safety

Safety is important. Pay attention to anything unusual that you notice during set up or operation.

**LISTEN** for thumps, bumps, rattles, squeals, air leaks, or unusual sounds.

**SMELL** odors like burning insulation, hot metal, burning rubber etc.

**FEEL** any changes in the way the equipment operates.

**SEE** problems with wiring and cables, hydraulic connections, or other equipment.

**REPORT** anything you see, feel, smell, or hear that is different from what you expect, or that you think may be unsafe.

## Work Area Safety

- Keep work area clean and well lit. Cluttered or dark areas invite accidents.

- Do not operate the butt welder in explosive atmospheres, such as in the presence of flammable liquids, gases or dust. The heat may ignite the dust or fumes.
- Keep children and bystanders away while operating the butt welding machine. Distractions can cause you to lose control.

## Personal Safety

- Wear a hard hat, safety shoes, safety glasses, and other applicable personal protective equipment.
- Remove hanging jewelry and rings, and do not wear loose-fitting clothing or long hair that could catch on controls or moving machinery.

## Electrical Safety

- Always ensure equipment is properly grounded. It is important to remember that if you are working in a wet environment with electrical devices. Proper ground connections help to minimize the chances of an electric shock.
- Frequently inspect electrical cords and unit for damage. Have damaged components replaced and service performed by a qualified electrician.
- Do not abuse the cord. Keep cord away from heat, oil, sharp edges or moving parts. Damaged or entangled cords increase the risk of electric shock.

**NOTICE:** Always connect units to the proper power source as listed on the unit, or in the owner's manual. Use GFCI electrical connections when available or required.

## Butt Fusion Machine Use and Care

- trimmer blades are sharp and can cut. Never attempt to remove blades while the trimmer (planing tool) is running, or is in the facing position between the clamps. Use care when operating the trimmer, and when handling the unit.
- The heater is hot and will burn clothing and skin. Keep the heater in its insulated heater stand or blanket when not in use, and use care when heating the pipes.
- Do not use the butt welder if the switch does not turn it ON and OFF. Any welder that cannot be controlled with the switch is dangerous and must be repaired.
- Maintain butt welder and accessories. Check for misalignment or binding of moving parts, breakage of parts and any other condition that may affect the operation. If damaged, have the tool repaired before use. Many accidents are caused by poorly maintained tools.

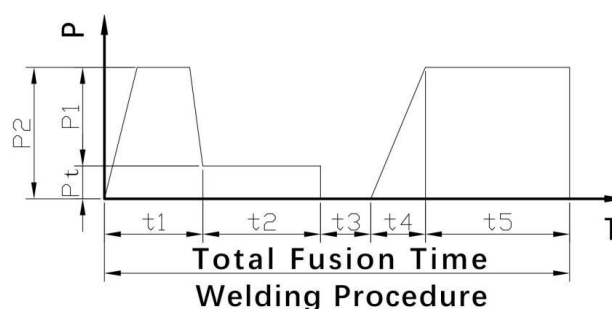
## Butt Welding Procedures:

P1: Welding force

P2: Total force,  $P2 = P1 + Pt$

Pt: Drag force

t1: The time for the welding bead reaching specific height



- t2: Heat soaking time (s) = pipe wall thickness (mm)×10  
t3: Change-over time (s)  
t4: Pressure build up time (s)  
t5: Cooling time (min)

### **Pipe inspection**

Before welding, first check if the pipe material and pressure setting are correct. Secondly check if there are obvious scratches or fissures on the surface of pipes/fittings. If the depth of scratches or fissures exceeds 10% of the wall thickness, cut the damaged section of pipe. Clear the pipe end surfaces with clean cloth.

### **Pipe clamping**

Place the pipes/fittings into reducers (inserts) of carriage (frame) and leave enough length of pipe to be welded. If the pipe out of the main frame is too long, it should be supported to keep level with the machine. Fasten the screws of clamps to fix the pipes/fittings.

### **Pipe milling (facing, or planing)**

Put the milling cutter (trimmer) between the pipes/fittings ends and switch on. Assure the pressure selector control is in the facing position. Move the carriage directional control to close the carriage. If the trimmer stalls, adjust the facing pressure so the trimmer continues to cut.

Shift the carriage directional control to the neutral position. Allow the trimmer to run for several revolutions to ensure that there are no chips hanging on the end of the pipe. Turn trimmer off.

Close the pipes/fitting ends and checks the alignment of pipes. The max misalignment should not exceed 10% of the wall thickness, and it could be improved by loosening or tightening the screws of clamps. The gap between two pipe ends should not exceed 10% of wall thickness; otherwise the pipes/fittings should be faced again.

### **Pipe heating**

Clear the dust and dirt on the surface of heating plate (Caution: Don't damage PTFE layer), and make sure the temperature has reached the required level.

Put the heating plate between the pipe ends after it reaches required temperature. Close the carriage (frame) to bring pipe ends in contact with the heater. Allow for bead-up according to pipe manufacturer's or appropriate joining standard recommendations.

Ensure the heater stays perpendicular to the pipe by supporting the heater during the heating process.

**NOTICE:** Ensure that the pipe remains in contact with heater throughout the entire process.

### **Pipe fusing**

Shift the carriage directional control to the neutral position. Open the carriage (frame) just enough to remove the heater. Quickly remove the heater. Inspect pipe ends for appropriate


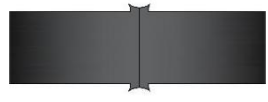




melt. Quickly close the carriage, bringing the pipe ends together under the fusion pressure. Allow joint to cool under pressure according to pipe manufacturer's recommendations. When it reaches the required cooling time, loosen the screw of clamps and then takes out the jointed pipes.

## Reference for Welding Parameters

Wall thickness (mm)	Bead height (mm)	Bead build-up force (KG)	Soaking time $t_2$ (sec)	Soaking pressure (kg)	Change-over time $t_3$ (sec)	Pressure build-up time $t_4$ (sec)	Welding force (KG)	Cooling time $t_5$ (min)
0 ~ 4.5	0.5	1.5	45	≤0.2	5	5	1.5±0.1	6
4.5 ~ 7	1.0	1.5	45 ~ 70	≤0.2	5 ~ 6	5 ~ 6	1.5±0.1	6 ~ 10
7 ~ 12	1.5	1.5	70 ~ 120	≤0.2	6 ~ 8	6 ~ 8	1.5±0.1	10 ~ 16
12 ~ 19	2.0	1.5	120 ~ 190	≤0.2	8 ~ 10	8 ~ 11	1.5±0.1	16 ~ 24
19 ~ 26	2.5	1.5	190 ~ 260	≤0.2	10 ~ 12	11 ~ 14	1.5±0.1	24 ~ 32

Remark: The force to to build up bead, to weld, varies for different operators, The KG listed, specifies the force to be applied on per  $CM^2$  of pipe jointing surface.

## Pipe Joints Visual check

Visually check: round bead, good joint	
Narrow and fall bead. Too high pressure while welding	
Too small bead. Pressure is not enough while welding	
A obvious gap between the welding beads. Temperature is not up to required figure or change-over time is too long.	
High & low bead. Different heating time or fusion temperature causes that.	
© Misalignment. Welding under the condition that the misalignment exceeds 10% of pipe wall thickness while align the two ends.	

## Maintenance

1. To ensure optimum performance, the machine must be kept clean and well maintained. With reasonable care, this machine will give years of service. Therefore, it is important that a regular schedule of preventive maintenance be kept.

2. Store machine under shelter, out of the weather, whenever possible.

3. The machine can be cleaned if needed with soap and water. Do not pressure wash. Dry the machine and lubricate some part to keep free of rusting.

4. To prevent slippage and ensure proper alignment, the clamping parts and inserts (reducers) must be clean. Clean the clamping parts and inserts (reducers) of any dirt or residual material using a stiff-bristled brush.

5. The lock nuts must turn freely. Keep the clamp lock bolt and nuts threads brushed clean. Lubricate the threads if needed.

6. trimmer (planing tool) blade should be inspected for damage and sharpness. Dull or chipped blades must be replaced.

**NOTICE:** Never extend the blade beyond the outer circumference of the trimmer (planing tool).

7. The heater faces must be kept clean and free of any plastic build up or contamination. Before each fusion joint the heater surfaces must be wiped with a clean dry lint free non-synthetic cloth.

**NOTICE:** Do not use an abrasive pad or steel wool. Use a non synthetic cloth that won't damage surfaces.

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