

Enfusion

Safe Chemical Drainage

Operating Instructions.

Specifications.

Operating Mode	Enfusion automatic
Operating Language	English
Operating Temperature	-20 °C to +50 °C
Input Voltage	110 V ac 88 V to 149 V (-20% +35%)
Input Current	11 A
Input Frequency	50 Hz 40 Hz to 70 Hz
Input Power	100 VA to 1250 VA
Output Current	18 A ac true rms
Output Voltage	3 V to 50 V ac true rem
Output Power	50 W to 900 W
Output Stability	+/- 1.5%
Welding Temperature Bands	COLD -17 °C to 3 °C NORMAL 4 °C to 30 °C HOT 31 °C to 49 °C
Weld Time: 1.5" & 2"	C 120 : N 90 : H 80
Weld Time: 3" to 12"	C 150 : N 120 : H 110
Weld Time: Flash 1.5" & 2"	n/a
Weld Time: Flash 3" to 12"	n/a
Power Factor	0.72
Weight	15 kg
Size	40 cm x 32 cm x 16 cm
Environmental Protection	IP65
Lead Length (to power case)	1 m
Lead Length (to hand held unit)	10 m
Lead Length (to fitting)	2 m

Advance Welding has a policy of continuously improving product design, and as such reserve the right to change specification of its products without prior notice and with impunity.

Index.

Specifications.....	2
Important.....	4
Making the Enfusion joint.....	5
Preparation	5
Welding	5
Making multiple Enfusion joints	6
Fault codes.....	7
Calibration and warranty	11
Certificate of conformity	11
Waste Electrical Electronic Equipment...14	
Restriction of Hazardous Substances.....14	
Repair information.....	14
Contact information	15

Important!

- **RISK OF EXPLOSION! This unit must not be used in a gaseous atmosphere.**
- **RISK OF ELECTRIC SHOCK! Do not open. No user serviceable parts inside.**
- **It is the responsibility of the operator to make sure the correct type of fitting is connected. This welding unit has been designed for use with Vulcathene Enfusion fittings only.**
- To avoid damaging the welding unit, do not interrupt the supply voltage or disconnect the output lead, while the unit is welding a fitting.
- This welding unit is Class 1, and must be used with an earthed supply (grounded).
- This welding unit has been designed for use with electrofusion fittings from the Enfusion range, up to a maximum diameter of 12 inches (305 mm).

Making the Enfusion Joint.

Before making the Enfusion joint, it is important to check that the power source is providing 88 to 149 volts at 40 to 70 cycles with 11 amp capacity. The Enfusion controller provides for reasonable and normal power variation, but generators in particular should be checked to assure that rated output is being provided.

Preparation.

Cut the pipe square and remove all burrs and loose material.

Using a pipe scraper, scrape the end of the pipe equivalent to the depth of the socket plus 50%.

Insert the pipe all the way to the stop at the bottom of the socket.

Decide whether the joint will be welded singly or in series.

Loosely fit the appropriate sized clamp(s) over the hub(s) of the socket(s) to be joined and push flush with the socket opening.

Tighten the clamp(s) round the hub(s) of the sockets. *It is important that the clamp(s) is/are fully tightened to obtain a homogeneous joint.*

Welding.

Turn the Enfusion unit on and it will self test.

Follow the instructions on the hand held display to “Connect Output Lead”. *If using a single joint, connect the output leads to one joint. If multiple joints, use the link leads as required.*

Use the SELECT button to choose the size of pipe being joined.

When the correct size is shown, press the START button to begin welding.

The Enfusion unit will count down the time while monitoring the welding parameters for faults.

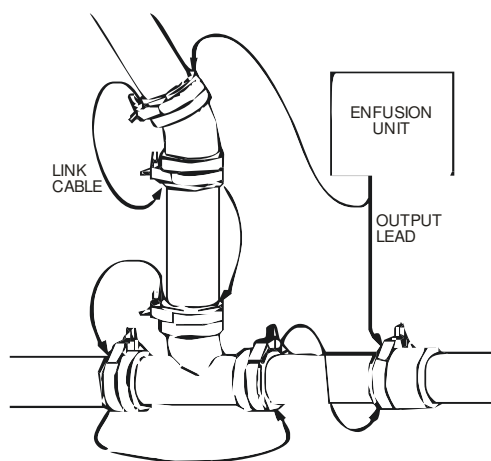
When complete, the display will show “Disconnect Output Lead”. Wait 30 seconds to allow the joint to cool, before carefully disconnecting the leads from the fittings.

The Enfusion unit will now reset, ready for the next operation.

Leave the joint(s) undisturbed for at least 5 minutes before removing the clamp(s).

Making multiple Enfusion joints.

The chart below indicates the number of joints which can be fused at any one time utilising additional link cables in series. It is important to remember that the chart only applies to joints of the same size. Do not attempt to use the multiple jointing method for connecting joints of different sizes.



SIZE	JOINTS
38 mm	10
51 mm	8
76 mm	4
102 mm	3
152 mm	2

Fault Codes

During operation, the welding unit monitors all aspects of its operation. If a fault occurs, an error message will be shown.

1: Stuck button on start up

This fault shows when the power is first switched on. Either the Stop, Start, or Select button is stuck in. Free the button to clear the fault.

2: Output fault before weld start

This fault shows when the power is first switched on. The unit will check the output terminals to make sure no voltage is present when first switched on. If this fault happens, the internal power relays have stuck in the closed position. The unit will need to be returned for service.

4: No calibration

This fault happens when the unit has no calibration. This will normally not show and, if the unit has been calibrated, would be caused by a fault with the internal memory. Return the unit for service.

10: Low supply frequency <40Hz

The unit has detected that the supply frequency is below 40 Hz. This will normally be caused by a poor quality generator. If this fault happens, check the supply or change the generator.

11: High supply frequency >70Hz

The unit has detected that the supply frequency is above 70 Hz. This will normally be caused by a poor quality generator. If this fault happens, check the supply or change the generator.

12: High supply voltage >140v

The unit has detected that the supply voltage is more than 140 volts. Check the supply voltage and, if necessary, use a different generator.

13: Low supply voltage <95v

This fault can be caused by a few problems. It could be that the generator is running slowly and so the supply voltage is low. Try speeding the generator up or use a different generator.

It could also be caused by a generator that is too small. If a large fitting is welded, a large amount of power will be needed from the generator. If it can not supply this power then it will stall and the voltage will drop away. Check that the generator is the correct size; if need be try another generator.

It could be caused by the use of long extension leads. If a large fitting is welded, a high current will be taken from the supply. If extension leads are used, there will be a voltage drop down the lead making the unit sense a low supply voltage. Try not to use extension leads with the unit. If you have to, use just 30 feet of cable, the same size fitted to the unit.

14: Relay failed to latch on weld start

This fault could happen when the start button is pressed. If the main power relays do not operate correctly, this fault will be shown. The unit needs to be returned for service.

20: Welding current excessive (>150%)

This fault will happen if the welding current is more than 50% high for more than 0.3 seconds. This fault is normally caused

by a fault within the unit, a short circuit triac. The unit must be returned for service.

21: Welding current high (>125%)

This fault will happen if the welding current is more than 25% high for more than 1 second. This fault is normally caused by a fault within the unit, a short circuit triac. The unit must be returned for service.

22: Welding current high (>112.5%)

This fault will happen if the welding current is more than 12.5% high for more than 1.5 seconds. This fault can be caused by a fault within the unit, a short circuit triac. It can also be caused by a poor quality generator with the supply voltage fluctuating. Try a different generator.

23: Welding current high (>106.25%)

This fault will happen if the welding current is more than 6.25% high for more than 2 seconds. This fault will normally be caused by a poor quality generator with the supply voltage fluctuating. Try a different generator.

24: Welding current high (>101.5%)

This fault will happen if the welding current is more than 1.5% high for more than 3 seconds. This fault will normally be caused by a poor quality generator with the supply voltage fluctuating. Try a different generator.

25: User stop button pressed

The operator has pressed the stop button.

26: Relay unlatched

During welding, if the main power relay disconnects this fault will be shown. It could be caused by the unit being knocked or

a temporary dip in the power supply. If the fault persists, the unit should be returned for repair.

27: Fitting open circuit

This fault is shown if the output lead disconnects from the fitting while welding. Follow the guidelines from the fitting manufacturer, reconnect the lead, and try welding again.

28: Welding current low (<98.5%)

This fault will happen if the welding current is more than 1.5% low for more than 3 seconds. This can be caused by a generator that is not big enough to supply the required power to the fitting. Check the size of the generator and if need be try another generator. It can also be caused by using long extension leads with the unit. It is recommended that only 30 feet of extension be used, and the cable should be the same thickness as the input lead on the unit.

29: Welding current low (<50%)

This fault will happen if the welding current is more than 50% low for more than 1 second. It can be caused by a faulty fitting. Try another fitting. If this doesn't clear the fault then there is a problem inside the unit and it must be returned for repair.

127: Power off failure

The power has been turned off while the unit is welding.

Calibration and Warranty.

This welding unit has been manufactured, inspected and tested in accordance with the quality control systems in place at *Advance Welding*.

This welding unit has been calibrated using equipment that is traceable to national and international standards, through a NAMAS (National Accreditation of Measurement and Sampling) accredited laboratory. NAMAS is a service of UKAS (United Kingdom Accreditation Service).

This welding unit has a twelve month calibration and warranty period, active from first use of the unit by the end user customer.

Full warranty terms and conditions are available on our web site.

Certificate of conformity.

This welding unit has been designed to comply with the harmonised standards under the "New Approach" directives, and has been CE marked accordingly.



89/336/EEC Electromagnetic compatibility

EN 61000-3-2:2001, IEC 61000-3-2:2000 Electromagnetic compatibility (EMC). Limits for harmonic current emissions (equipment input current up to and including 16 A per phase)

EN 61000-3-3:1995 Electromagnetic compatibility (EMC) -- Part 3-3: Limits - Limitation of voltage changes, voltage fluctuations and flicker in public low-voltage supply systems, for equipment with rated current ≤ 16 A per phase and not subject to conditional connection

73/23/EEC Low voltage equipment

EN 61293:1994 Marking of electrical equipment with ratings related to electrical supply - Safety requirements

EN 60446:2006 Basic and safety principles for man-machine interface, marking and identification - Identification of conductors by colours or alphanumerics

EN 60529:1991/A1:2000 Degrees of protection provided by enclosures (IP Code)

EN 50262:1998 Cable glands for electrical installations

EN 60228:2005 Conductors of insulated cables

HD 22.10 S1:1994 Rubber insulated cables of rated voltages up to and including 450/750 V -- Part 10: EPR insulated and polyurethane sheathed flexible cable

EN 61140:2002 Protection against electric shock - Common aspects for installation and equipment

EN 60269-1:1998/A1:2005 Low-voltage fuses -- Part 1: General requirements

EN 60204-1:2006 Safety of machinery - Electrical equipment of machines -- Part 1: General requirements

EN 61310-1:2005 Safety of machinery - Indication, marking and actuation -- Part 1: Requirements for visual, acoustic and tactile signals

EN 61310-2:2005 Safety of machinery - Indication, marking and actuation -- Part 2: Requirements for markings

EN 61310-3:2005 Safety of machinery - Indication, marking and actuation -- Part 3: Requirements for the location and operation of actuators

EN 61058-1:2002/prA2:2005 Switches for appliances -- Part 1: General requirements

98/37/EC Machinery safety

EN ISO 12100-1:2003 Safety of machinery - Basic concepts, general principles for design - Part 1: Basic terminology, methodology (ISO 12100-1:2003)

EN ISO 12100-2:2003 Safety of machinery - Basic concepts, general principles for design - Part 2: Technical principles (ISO 12100-2:2003)

EN 418:1992 Safety of machinery - Emergency stop equipment, functional aspects - Principles for design

EN 349:1993 Safety of machinery - Minimum gaps to avoid crushing of parts of the human body

EN 60204-1:2006 Safety of machinery - Electrical equipment of machines -- Part 1: General requirements

EN 61310-1:2005 Safety of machinery - Indication, marking and actuation -- Part 1: Requirements for visual, acoustic and tactile signals

EN 61310-2:2005 Safety of machinery - Indication, marking and actuation -- Part 2: Requirements for markings

EN 61310-3:2005 Safety of machinery - Indication, marking and actuation -- Part 3: Requirements for the location and operation of actuators

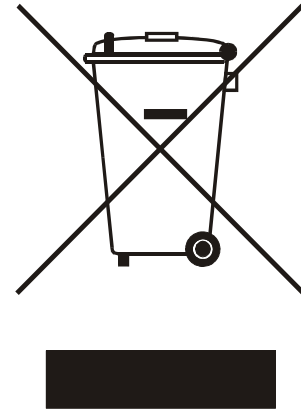
On behalf of
Advance Welding:

Kevin Wilkinson

Waste Electrical Electronic Equipment – WEEE

Within the European union, this symbol indicates that this product should not be disposed of within household waste. It should be taken to an appropriate recycling facility.

Advance Welding is a member of a WEEE compliance scheme. For information on how to recycle this product responsibly, please visit our web site.



Restriction of Hazardous Substances – RoHS

This Directive bans the placing on the EU market of new electrical and electronic equipment containing more than agreed levels of lead, cadmium, mercury, hexavalent chromium, polybrominated biphenyl (PBB) and polybrominated diphenyl ether (PBDE) flame retardants.

RoHS Compliant
Directive 2005/ 95/ EC



Repair Information.

There are no user serviceable parts inside the welding unit. If an internal fault happens with the unit then it must be returned to *Advance Welding* or one of its authorised service agents for repair.

Contact Information.

This equipment has been manufactured in the UK by:

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