

! IMPORTANT - READ THIS FIRST!

Please read this document carefully

Version 1 17/07/08

EF1 - 230V Hand-held Welder

User Manual



**NOTE: EF1 welding cables use special 7 pin connectors
NOT regular 4 pin connectors**



Delivered Items:

EF1 Welding Unit
Carrying Case (Tool Roll)
Red, Primary welding cable
Green, Secondary welding cable
White, Fusion Chamber welding cable
2 x Red, Primary link cables
Manual

NB: when parts are missing or damaged, please contact your dealer.

Introduction

This manual gives instructions on the correct use of the EF1 welding unit. It is important that these instructions are read and understood prior to use of this equipment and that they are kept with the welder for the life of this unit.

The EF1 automatically recognises the fitting when connected with the correct welding cable and applies the correct amount of energy for a successful weld. It also checks the ambient temperature using a sensor positioned on the main supply cable and adjusts the energy level to balance with the local environment.

The EF1 has an ON / OFF button, a weld start button and an LED display showing the weld progress and fault indication

Safety Notes

- RISK OF EXPLOSION! - This welding unit must not be used in a gaseous atmosphere.
- RISK OF ELECTRIC SHOCK! - Do not open. No user serviceable parts inside.
- This welding unit is only to be used by trained persons, certified by PetroTechnik .
- Visually inspect welding unit, cables and connectors and replace any damaged parts prior to use.
- For use outside of hazardous areas (ATEX zones 0, 1 and 2)
- To avoid damage to the welding unit, do not interrupt the supply voltage or disconnect the output lead, while the unit is in operation.
- Never lift or pull the welder by its cables.
- Never disconnect welding cables by pulling them always pull on the connectors.
- Keep bystanders a safe distance from welder during welding operations.
- Always use safety equipment (Hi-visibility jacket, Safety Boots, Safety Helmut and Safety Goggles) when operating on site.
- Always isolate welding unit from its power supply before adjusting, cleaning, un-tangling cables or leaving unattended for any period.
- The operator is responsible for accidents or hazards occurring to other people or their property while using this equipment (Keep the Work Area Safe).
- Weld only in daylight or good artificial light.
- Do not weld in the rain or leave equipment outdoors while it is raining.
- Do not start welder without connecting welding cables to a properly prepared fitting assembly.
- Do not touch the fitting during the welding cycle.
- Ensure the EF1 is positioned in the environment it is to be used in prior to welding so that the temperature sensor has opportunity to reach the ambient temperature prior to use.

Application

The EF1 is designed to automatically weld UPP Primary and Secondary Containment electrofusion fittings, Electrofusion Chambers and Large diameter 10 amp fittings. This is achieved by using colour coded welding leads as shown below.

Type of Fitting	Welding Cable Colour	Size of Welding Pin (mm)	Current (amps)	Weld Time @ 20C (Seconds)
Primary	Red	4	4	184
Secondary	Green	2	5	80
Fusion Chamber	White	2.3	7	360
Large Diameter (10 amp)	Black	2	10	365

The EF1 can be used in ambient temperatures between -15°C and +45°C

Only personnel fully trained and certified in the use and installation of the UPP system should use this equipment.

Liability Restrictions

All liabilities of the supplier are invalidated in the following cases:

- The EF1 is used outside the indicated application area
- Non-UPP fittings or pipe are used
- The operator has not been trained to use the EF1 or the UPP system
- Operating instructions have not been observed
- Unauthorised repairs, maintenance or modifications have been carried out
- The EF1 has been used outside of its technical specification
- Safety instructions have not been observed
- Improper or inadequate maintenance
- Misuse or any use not in accordance with the operating manual or good industry practice
- Physical abuse of the product
- Improper site preparation or site maintenance

Using the EF1

Ensure that the machine is positioned outside hazardous zones ATEX 0, 1 and 2

Allow the machine and fittings to reach the ambient temperature of the site.

Keep the machine out of direct sunlight and free of any obstruction.

Make sure fittings and pipe have been prepared in accordance with UPP Installation instructions.

Step	Action	Information on Display
1	Connect the required welding lead to the EFI Welder PRIMARY fittings = RED cable SECONDARY fittings = GREEN cable FUSION CHAMBER = WHITE cable 10 AMP fittings = BLACK cable	None
2	Connect welding lead to the UPP fusion fitting(s), making sure connectors are firmly pushed onto pins	None
3	Connect the EFI Welder to a suitable 230v power supply	None
4	Switch ON	All LEDs light in sequence, then green Power LED remains on
5	Press and hold orange START button until first weld light illuminates	First weld light comes on then successive LEDs light up until green 100% LED is lit, showing weld is complete
6	Disconnect welding lead from fitting	100% LED and Power LED remains on
7	ALWAYS Reset for next weld by holding START button for 3 seconds	All LEDs light in sequence, then green power LED remains on

Multiple Welds

In Primary mode the EF1 can simultaneously weld up to three UPP fittings, provided that:

- The sum of the resistance values (circled number on UPP fittings) does not exceed 10
- The UPP fittings are connected to the EF1 in series using the bridging leads provided (see photos below).



You can ensure that you have connected the fittings correctly and that the welds are successful by checking that all of the connected fittings get warm and that all of the indicator pins are exposed at the end of the welding time.

For multiple welds on secondary fittings refer to Technical Bulletin No. TB29.

Other Useful Tips

Switch off the machine during breaks and at the end of the job.

The weld cycle can be stopped at any time by pressing the START / STOP button. This will generate an error code and you must wait for the fitting to cool before attempting to continue.

If you have any doubt about a welded joint, UPP fittings can be welded again provided they are left to cool to ambient temperature.

NEVER RE-WELD A FITTING THAT IS STILL WARM

Fault Indicators

When an error has occurred during the weld cycle that will have an effect on the success of the joint, the red warning LED on the right side of the display will light up. Also one of the “weld progress” lights will light up at the same time to show what type of fault has occurred.

Error Led	Fault Indicated	Meaning	Solution
1	Power supply failure during weld	The power supply was off at sometime during the weld	Check and rectify power supply Check plug connection Check cables are not damaged or broken Re-weld fitting only after it is allowed to cool to ambient temperature
2	Stop button pressed during weld		Re-weld fitting only after it is allowed to cool to ambient temperature
3	Power supply out of limits	Supply frequency not between 45 and 65 Hz, or Voltage not between 194 & 264V	Check and rectify generator output Check mains supply Make sure supply is to required specification
4	Ambient temperature out of range	Temperature of the EF1 is not between -15°C and +45°C	Allow EF1 and fitting to cool in the shade Wait for ambient temperature to return to range
5	No output current (open circuit)	Loose connection to terminal pin Loose contact in the welding circuit Faulty fitting Start button not depressed for long enough	Make sure connectors are pushed firmly on to terminal pins Check welding cable connection and continuity Replace fitting See operating sequence, step 5
6	Low output current	Resistance value of fitting is too high Too many fittings connected in series (Primary mode only) Input voltage too low	Use only UPP electrofusion fittings and correct welding cable Check resistance codes on fittings - do not exceed a sum total of 10 Check supply voltage Check extension leads being used are to specification
7	High output current	Regulation error in electronics	Switch off machine and switch on again after 10 seconds. Ensure welder is within temperature range If problem persists, return EF1 to supplier

The EF1 can be reset after a fault has been rectified by pressing and holding the START / STOP button for 3 seconds.

Technical Details

UPP Stock Code Number	EF1-230V
Operating Voltage	230v +/-15% (194 to 264v)
Supply Current	10A ac maximum
Supply Power	4,000 W
Supply Protection	Class 1 - Earthed
Operating Frequency	45 to 65Hz
Welding Power Rating	1670VA
Protection Class	IP65
Operating Temperature	-15°C to +45°C
Shipping Dimensions	460mm wide x 210mm deep x 210mm high
Shipping Weight	3.60kg

Operating Requirements

WARNING!

This machine is for the electrofusion welding of UPP Systems products only

Power Supply

This machine must be powered with

- A good quality 230V AC, 50Hz power supply with maximum tolerance of $\pm 15\%$
- A good quality generator capable of supplying a minimum of 3,500 Watts
(An Earth Spike must be used with Generators).
- If used with a 110v to 230v step-up transformer the following specification should be used:-

Safety Isolating Transformer	minimum 4,000 watts
Auto Transformer	minimum 2,000 watts

Extension Leads

Extension cables should comply with H07RNF or equivalent and should be free from any damage.

The maximum input lead lengths are as follows:

1.5mm² (AWG 15) Cable : 25m

2.5mm² (AWG 13) Cable : 50m

4.0mm² (AWG 11) Cable : 75m

Note: All cable must be unwound from the reel to stop inductive heating effects

Maintenance

- There are no user serviceable parts inside the EF1 welding unit.
- Damaged or defective products should be returned to an approved service agent for repair or calibration.
- The EF1 welding unit should be tested for electrical safety and calibrated every twelve months.
- Welding unit and cables should be checked for damage or defects and parts repaired or replaced prior to each use.
- The welding unit can be cleaned using a soft brush or cloth.
- After use carefully coil cables and store in the compartments provided in the carry case.
- Electrical Safety Testing "Portable Appliance Test" (PAT) should be carried out in accordance with local legislation

Disposal



The equipment and packaging should be sorted for environmentally friendly recycling.

DO NOT DISPOSE OF THIS EQUIPMENT INTO HOUSEHOLD WASTE!

RoHS Compliant
Directive 2005/ 95/ EC

According to the European Directive 2002/96/EC Waste Electrical and Electronic Equipment (WEEE), when no longer suitable for use, this equipment must be separately collected and sent for recycling.



According to the European Directive 2005/95/EC Restriction of Hazardous Substances (RoHS), this equipment does not contain more than the agreed levels of Lead, Cadmium, Mercury, Hexavalent Chromium, Polybrominated Biphenyl (PBB) and Polybrominated Diphenyl Ether (PBDE) flame retardants.

Declaration of Conformity

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

The applicable standards are:

89/336/EEC Electromagnetic compatibility
73/23/EEC Low voltage equipment
98/37/EC Machinery Safety

Signed on behalf of PetroTechnik
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