Highland H630 V2

Electrofusion Processor

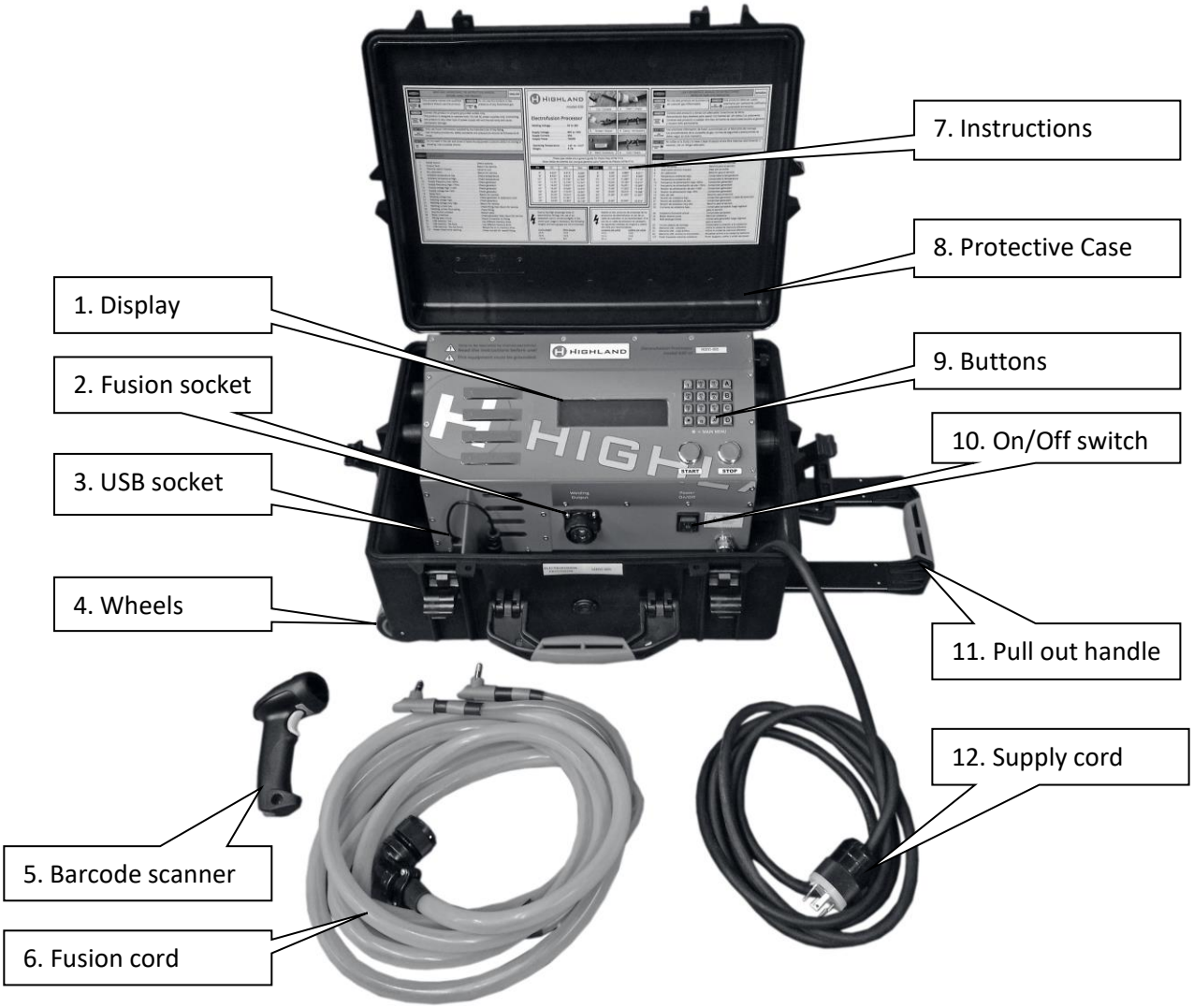
(240V Supply)

Operating manual

Index

Operating Controls

1. Display
2. Fusion socket
3. USB socket
4. Wheels
5. Barcode scanner
6. Fusion cord
7. Instructions
8. Protective case
9. Buttons
10. On/Off switch
11. Pull out handle
12. Supply cord



Safety Notes

- **RISK OF EXPLOSION !**
  This processor must not be used in a gaseous atmosphere.
- **RISK OF ELECTRIC SHOCK !**
  Do not open. No user serviceable parts inside.
- Before using, always visually inspect the processor to see that the cords and connectors are not worn or damaged. Replace the damaged part before welding.
- Switch off and remove the plug from the mains before adjusting, cleaning, or if the cords are entangled and before leaving the processor unattended for any period.
- To avoid damaging the processor, do not interrupt the supply voltage or disconnect the welding cord, while it is welding a fitting.
- Do not lift or pull the processor by its cables.
- Do not disconnect the welding cords by pulling on them, always pull off the connectors from the fitting.
- Do not start a weld without the pipe correctly inserted into the fitting.
- Do not touch the fitting while welding.
- Do not weld in the rain/snow or leave the processor outdoors while it is raining/snowing.
- Weld only in daylight or in good artificial light.
- **Keep the work area safe!**
  The operator is responsible for accidents or hazards occurring to other people or their property while using this processor.
- Keep bystanders a safe distance away from the processor while welding.
- Never allow people unfamiliar with these instructions to use the welding processor.

Product Specification

Operating Type:	Controlled voltage.
Operating Modes:	Manual, Bar code
Operating Languages:	English, Spanish
Operating Temperature:	-40°F to +122°F
Welding Voltage:	8 to 48 V ac
Welding Current:	1 to 63 A ac
Welding Power:	80 to 3000 VA
Welding Time:	1 to 3600 seconds
Apparent Power Factor:	0.36 to 0.72
Supply Voltage:	240 V ac (+/- 20%) 40 to 70 Hz
Supply Current:	1 to 15 A ac
Supply Power:	3,600 W
Supply Protection:	Class 1 – Grounded
Data log memory:	2048 welds
Data download/upload:	USB flash memory drive
Weight:	61 lb
Size:	20” x 15” x 10”
Protection Level:	IP65

We have a policy of continuously improving product design, and as such we reserve the right to change specification of the product without prior notice and with impunity.

Intended Use

This processor is intended to weld constant voltage electrofusion fittings suitable for low, medium and high pressure pipe work systems.

This processor has been designed to comply with the International Organization for Standardization standard ISO12176-2:2000 "Plastic pipes and fittings, equipment for fusion jointing polyethylene systems , part 2, electrofusion".

Introduction

This manual gives instructions on the correct assembly and safe use of your Electrofusion Processor. It is important that you read these instructions carefully, and keep these instructions for the life of the processor.

This manual does not detail the specific welding procedure for the fittings: scraping, clamping and assembly of joints. For this information you must contact the manufacturer of the fittings.

Delivered Items

Carefully remove the welding processor from its packaging and check that you have the following items:

- Electrofusion processor.
- Welding cord.
- USB flash memory drive.
- Bar code scanner and cable in pouch.

When parts are missing or damaged, please contact your dealer.

Electrical Safety

WARNING! Switch off and remove the plug from the mains before adjusting, cleaning or if the cord is cut, damaged or entangled.

This welding processor is Class 1 and requires an earthed (grounded) connection. An earth spike must be used with generators. The power source must be capable of providing 3600 Watts at 240 volts.

This processor is fitted with a 15 amp supply plug.

Due to the high amperage draw of electrofusion fittings, the use of an extension cord is not encouraged. In the event this is necessary, the following lengths and wire gauges are recommended:

25 ft = 12/3 , 50 ft = 10/3 , 100 ft = 8/3

All cables must be unwound from the reel to stop inductive heating effects.

The supply cord must be inspected for signs of damage before each use and the processor may only be used if in perfect condition. Damaged cords must be replaced by an approved service agent.

This equipment is classified as “Portable for use on industrial applications”, and must undergo a formal electrical safety check as per local regulations.

Using the equipment

This Electrofusion Processor takes the ambient temperature into account when calculating the energy required to weld the fitting. It must therefore be allowed to reach ambient temperature before use and must be at the same temperature as the fitting to be welded.

Prepare and clamp the pipe and fittings inline with the manufacturer's recommendations.

Connect the welding cord to the processor and the fitting to be welded. Connect the supply cord to the correct supply voltage and switch the processor on.

The screen will show a welcome message then the software version and date.

```
HIGHLAND
H630V2 UNIT
09:29 07/18/17
V 3.3H00 E (C)2017
```

The software version is shown on the bottom line.

After a short pause the owner details are shown.

After another short pause the main menu is shown.

```
A=MANUAL WELDING
B=BARCODE

D=OPTIONS
```

During operation, except while welding, pressing the star key on the keypad will jump back to this menu.

Using the equipment *continued...*

Notes:

The operation of the processor can be customised by turning welding modes on and off, along with some features like the cooling time and data logging. This manual details all available modes and features. For information on how to customise the welding unit see the "Set Up" section later on in this manual.

The welding processor is fitted with an alpha-numeric keypad, which is used by the operator to input data. Down the right hand side there are four Quick-Keys, A B C D. These act as quick shortcut keys, their function being prompted on the screen.

When entering data, letters and numbers can be selected by repeatedly pressing the same key, e.g. A B C 2 A B C 2 . After a short pause the cursor will move to the next position. Special characters and spaces can be selected by pressing the 1 or 0 keys. (This is the same method used for text with mobile cell phones.)

Pressing the A Quick-Key will Accept the data.

Pressing the B Quick-Key will step Back one position.

Pressing the C Quick-Key will Clear the input field.

Data Log Memory

The processor can record information about the weld, along with the date and time, and additional operator entered information.

It is possible to enter three pieces of information to identify the weld. The first is the Operator's Name, the second is the Location where the weld is being done, and the third is an Information field for more details.

The display will show all three pieces of information:

	A	=	A	C	C	E	P	T		B	C	D	=	C	H	A	N	G	E
	B	=	O	P	E	R	A	T	O	R									
	C	=	L	O	C	A	T	I	O	N									
	D	=	J	O	B		R	E	F	E	R	E	N	C	E				

Pressing the B Quick-key will select the 'Operator Name' and allow changes to be made.

C	H	A	N	G	E		O	P	E	R	A	T	O	R		N	A	M	E
_	_	_	_	_	_	_	_	_	_	_	_	_	_	_	_	_	_	_	_
	A	=	O	K		B	=	B	A	C	K		C	=	C	L	E	A	R

Enter the required information and press the A Quick-key to accept it.

Pressing the C Quick-key will select the 'Location' and allow changes to be made.

C	H	A	N	G	E		L	O	C	A	T	I	O	N				
_	_	_	_	_	_	_	_	_	_	_	_	_	_	_	_	_	_	_	_
	A	=	O	K		B	=	B	A	C	K		C	=	C	L	E	A	R

Enter the required information and press the A Quick-key to accept it.

Data Log Memory *continued…*

Pressing the D Quick-key will select the 'Job Reference Field' and allow changes to be made.

C	H	A	N	G	E		J	O	B		R	E	F	E	R	E	N	C	E
_	_	_	_	_	_	_	_	_	_	_	_	_	_	_	_	_	_	_	_
	A	=	O	K		B	=	B	A	C	K		C	=	C	L	E	A	R

Enter the required information and press the A Quick-key to accept it.

	A	=	A	C	C	E	P	T		B	C	D	=	C	H	A	N	G	E
	B	=	J	O	H	N		S	M	I	T	H							
	C	=	1		M	A	I	N		S	T	R	E	E	T				
	D	=	H	C	9	8	9	4	5										

When all the information has been entered, press the A Quick-key to accept it.

This information will be saved when the weld has been completed, and will be prompted the next time a new weld is carried out.

The display will also ask if the pipe/fitting has been scraped and clamped. Select yes or no using the Quick-Keys. This information will be saved on the data log memory.

The processor can save 2048 welds in memory. When the memory is full, it will be overwritten from the beginning in blocks of 24 welds. This will allow the last 2000 welds to be held in memory.

Manual Welding

This mode of operation is designed to weld all 39,5 volt fittings in manual mode.

It is the operator's responsibility to make sure the correct fitting is being welded.

```
A = MANUAL WELDING
B = BARCODE
D = OPTIONS
```

From the main menu:
Press the A Quick-Key to select Manual Welding.

If data logging has been set as mandatory, then the data logging screens will appear. Complete this information as appropriate.

If data logging has been set as optional then the screen will ask if you want to log this weld or not.

```
MANUAL WELDING
A = DATA LOG OFF
B = DATA LOG ON
```

Press A or B to select your option.

If data logging has been turned off then the screen will move on to the next message:

```
CONNECT
WELDING CORD
AND FITTING
```

Make sure the welding cord is attached to the processor and to the fitting terminals.

Manual Welding *continued...*

The display will now prompt for the welding time to be entered.

```
                    A = ACCEPT
  TIME =  55s       C = CHANGE
  TEMP = +80F
VOLTS = 39.5        D = VOLTS
```

Press the C Quick-key to select the welding time. Enter this from the numbered keypad, e.g. 55. This can be between 1 second and 3600 seconds. Press the A Quick-key to accept the new time. Next the voltage should be selected. Press the D key. Enter the required voltage then press the A Quick key. When the correct time and voltage have been selected, press the A Quick-key to accept them.

If data logging is on, then the next screen will be shown:

```
  PIPE SCRAPED AND
  FITTING CLAMPED?
  A = YES
  B = NO      D = CANCEL
```

The operator can select yes or no. However, it is good industry practice to scrape the pipe and clamp the fitting before carrying out an electrofusion weld.

The display will now ask for the START button to be pressed.

```
                    PRESS
  TIME =  55s       START
VOLTS = 39.5
                    D = CHANGE
```

If the welding parameters are correct then press the Start button to begin welding. If the parameters need to be changed, press the D Quick-Key.

The weld will now start and the screen will show the following:

```
    VOLTAGE = 39.5
  WELD TIME =  55s
  REMAINING =  43s
    39.50V     4.49A
```

Manual Welding *continued...*

The set voltage and time will be shown, along with the time remaining and the welding voltage and current.

The remaining time will count down to zero.

During the weld, the processor will monitor the welding to make sure it does not go out of limits. Any faults that are detected will terminate the welding and cause an error message to be displayed. These are listed later on in this manual.

At the end of the weld, if enabled, the cooling time will be shown. This counts upwards from zero and will continue until stopped by the operator. This is shown as an aid to the operator to allow them to know how long it was since the weld finished.

```
  COOLING TIME=00:10
   WELD NUMBER=  5


PRESS ANY KEY TO END
```

Press any key to continue.

```
      WELD  0005
      DISCONNECT
   WELDING CORD
   FROM FITTING
```

The display will ask for the welding cord to be disconnected from the fitting. Doing this will reset the unit back to the welding menu.

Bar Code Welding

This mode of operation is designed to weld bar coded fittings in fully automatic mode. The processor is supplied with a wireless Blue Tooth scanner. Make sure that the Blue Tooth receiver is connected to the USB socket on the unit.

It is the operator's responsibility to make sure the correct fitting is being welded.

```
A = MANUAL WELDING
B = BARCODE
D = OPTIONS
```

From the main menu:
Press the B Quick-Key to select Barcode Welding.

If data logging has been set as mandatory, then the data logging screens will appear. Complete this information as appropriate.

If data logging has been set as optional then the screen will ask if you want to log this weld or not.

```
BARCODE WELDING
A = DATA LOG OFF
B = DATA LOG ON
```

Press A or B to select your option.

If data logging has been turned off then the screen will move on to the next message:

```
CONNECT
WELDING CORD
AND FITTING
```

Make sure the welding cord is attached to the processor and to the fitting terminals.

Bar Code Welding *continued…*

If data logging is on, then the next screen will be shown:

	P	I	P	E		S	C	R	A	P	E	D		A	N	D	
	F	I	T	T	I	N	G		C	L	A	M	P	E	D	?	
	A	=	Y	E	S												
	B	=	N	O				D	=	C	A	N	C	E	L		

The operator can select yes or no. However, it is good industry practice to scrape the pipe and clamp the fitting before carrying out an electrofusion weld.

If the barcode reader is not connected to the USB port (either a wired scanner or a Bluetooth scanner) then the following message will be shown:

		C	O	N	N	E	C	T									
		B	A	R	C	O	D	E		R	E	A	D	E	R		
		T	O		U	S	B		P	O	R	T					
		C	=	M	A	N	U	A	L		E	N	T	R	Y		

Connect the scanner. If you do not have a scanner but still want to use barcode mode, pressing the C Quick-key will allow the numbers in the barcode to be entered manually.

If extended traceability codes are enabled, then the screen will ask for the traceability code to be read.

	T	R	A	C	E	A	B	I	L	I	T	Y		C	O	D	E	S	
	R	E	A	D		C	O	D	E		#	1							
	C	=	M	A	N	U	A	L		E	N	T	R	Y					
	A	=	F	I	N	I	S	H		D	=	C	A	N	C	E	L		

You can read up to five traceability codes. When these have been read press the A Quick-key to move on.

The screen will now ask for the fusion bar code to be read.

		F	U	S	I	O	N		B	A	R	C	O	D	E		
		R	E	A	D		C	O	D	E							
		C	=	M	A	N	U	A	L		E	N	T	R	Y		
		D	=	C	A	N	C	E	L								

Bar Code Welding *continued...*

Read the barcode on the fitting. If the scanner does not work then pressing the C Quick-Key will allow the barcode numbers to be manually entered.

	F	U	S	I	O	N					A	=	A	C	C	E	P	T
	_	_	_	_	_	_	_	_	_	_	_	_	_	_	_	_	_	_
	_	_	_	_	_	_												
	C	=	C	L	E	A	R				D	=	C	A	N	C	E	L

The fitting information will now be displayed:

	F	R	I	A		I		0	9	0	M	M						
	T	I	M	E	=		5	0	s									
V	O	L	T	S	=	4	0	.	0				P	R	E	S	S	
	T	E	M	P	=	+	8	0	F				S	T	A	R	T	

If the welding parameters are correct then press the Start button to begin welding. If the parameters need to be changed, press the D Quick-Key.

The weld will now start and the screen will show the following:

			V	O	L	T	A	G	E	=	4	0	.	0				
	W	E	L	D		T	I	M	E	=		5	0	s				
	R	E	M	A	I	N	I	N	G	=		4	3	s				
			3	9	.	5	0	V			4	.	4	9	A			

The set voltage and time will be shown, along with the time remaining and the welding voltage and current.

The remaining time will count down to zero.

During the weld, the processor will monitor the welding to make sure it does not go out of limits. Any faults that are detected will terminate the welding and cause an error message to be displayed. These are listed later on in this manual.

At the end of the weld, if enabled, the cooling time will be shown. This counts upwards from zero and will continue until stopped by the operator. This is shown as an aid to the operator to allow them to know how long it was since the weld finished.

Bar Code Welding *continued…*

	C	O	O	L	I	N	G		T	I	M	E	=	0	0	:	1	0
		W	E	L	D		N	U	M	B	E	R	=		5			
P	R	E	S	S		A	N	Y		K	E	Y		T	O		E	N	D

Press any key to continue.

						W	E	L	D			0	0	0	5			
						D	I	S	C	O	N	N	E	C	T			
					W	E	L	D	I	N	G		C	O	R	D		
					F	R	O	M		F	I	T	T	I	N	G		

The display will ask for the welding cord to be disconnected from the fitting. Doing this will reset the unit back to the welding menu.

Downloading the Weld Memory

The data log memory is downloaded by using an 'industry standard' USB flash memory device.

The data can be encrypted for protection, to stop unauthorised alteration of the information.

A data download manager is available free of charge and is supplied on the USB memory device with the welding unit. This allows the encrypted data to be read, filtered, printed and saved. It also allows the data to be saved as an encrypted file or as a Microsoft Excel spreadsheet.

From the main menu:

	A	=	M	A	N	U	A	L		W	E	L	D	I	N	G	
	B	=	B	A	R	C	O	D	E								
	C	=	O	T	H	E	R		M	O	D	E	(	S	)		
	D	=	O	P	T	I	O	N	S								

Press D for Options.

	A	=	D	O	W	N	L	O	A	D		D	A	T	A		L	O	G
	B	=	S	E	T		T	I	M	E		&		D	A	T	E		
	C	=	C	H	A	N	G	E		L	A	N	G	U	A	G	E		
	D	=	M	O	R	E		O	P	T	I	O	N	S					

Connect the USB memory drive to the USB socket on the processor.

Press A for download.

			D	A	T	A		D	O	W	N	L	O	A	D			
	A	=	C	O	N	T	I	N	U	E								
	B	=	V	I	E	W		L	A	S	T		W	E	L	D		
	D	=	C	A	N	C	E	L										

To view the last weld details on the screen press the B key. To download the data log press the A key.

The screen will now show:

Downloading the Weld Memory *continued...*

```
ENUMERATING DEVICE
PLEASE WAIT
```

The software is now setting up the memory drive to accept the download. When this is complete the screen will show:

```
DOWNLOADING
PLEASE WAIT
```

The data is now being downloaded onto the USB memory drive. When this is complete the screen will show:

```
 DOWNLOAD COMPLETE
 RESET LOG?
 A=YES
 D=NO
```

To save the weld data in the processor memory press the D key. However if you want to clear the processor memory press the A key. This action only affects the processor memory. The downloaded data on the USB drive is not changed.

The screen will now show:

```
 DOWNLOAD COMPLETE
 RESET LOG?
 A=YES
 D=NO
```

Disconnect the USB memory drive from the USB socket.

The data can be download as either an encrypted PFD file, or as a plain text XLS file. To change the setting, please contact your approved service centre.

Upgrading the Operating Software

The operating software can be upgraded through the external USB connector. New software is loaded onto a USB memory drive then flashed into the welding unit using a password code. This allows the software to be upgraded without opening up the unit or changing the memory chip.

Software upgrade must be carried out by an approved service agent, and are emailed from the manufacturer.

Set Up Options

The operation of the processor can be customized to allow it to fit into your working practices. Many things can be changed and these are done through the Options menu.

From the main menu:

```
A = MANUAL WELDING
B = BARCODE
D = OPTIONS
```

Press D for Options.

```
A = DOWNLOAD DATA LOG
B = SET TIME & DATE
C = CHANGE LANGUAGE
D = MORE OPTIONS
```

To set the time and date, press the B Quick-key.

```
24HR CLOCK A=ACCEPT
              C=CLEAR
   09:30
```

Enter the correct time using the keypad. Press the A key to continue.

```
DATE SETTING
ENTER PASSWORD
_ _ _ _      A=ACCEPT
   C=CLEAR   D=CANCEL
```

To change the date a password is required. Please contact you distributor for this. A password is required to stop the date being changed by unauthorised people to alter the calibration period.

To set the language, from the main menu press the C Quick-Key.

```
CHANGE LANGUAGE EN
ENTER PASSWORD
_ _ _ _      A=ACCEPT
   C=CLEAR   D=CANCEL
```

Set Up Options *continued…*

To change the language a password is required. Please contact your distributor for this.

Further settings can be changed from the More Options menu. To access this, from the main menu select D Options:

	A	=	M	A	N	U	A	L		W	E	L	D	I	N	G	
	B	=	B	A	R	C	O	D	E								
	D	=	O	P	T	I	O	N	S								

From the Options menu select D More Options:

	A	=	D	O	W	N	L	O	A	D		D	A	T	A		L	O	G
	B	=	S	E	T		T	I	M	E		&		D	A	T	E		
	C	=	C	H	A	N	G	E		L	A	N	G	U	A	G	E		
	D	=	M	O	R	E		O	P	T	I	O	N	S					

The screen will now ask for a password:

	S	Y	S	T	E	M		O	P	T	I	O	N	S					
	E	N	T	E	R		P	A	S	S	W	O	R	D					
		_	_	_	_							A	=	A	C	C	E	P	T
			C	=	C	L	E	A	R			D	=	C	A	N	C	E	L

All of the following settings require different passwords. Please contact your distributor if you want to change these.

Modes of Operation.

The settings for Manual mode and Barcode mode are as follows:

Manual: On/Off, Cooling time On/Off, Data logging On/Off,

Barcode: On/Off, Cooling time On/Off, Data logging On/Off, Traceability On/Off

Calibration Period.

The calibration period can be set between 1 month and 99 months (or turned off). This period is displayed when the processor is first turned on. When the calibration has expired, it can be set to warn the operator or lock the unit.

Set Up Options *continued…*

Owner Details.

The owner details, shown when the unit is first switched on, can be entered or changed.

Download Format.

The format of the data log download can be changed from protected PFD to plain text XLS.

Hidden Data Download.

Even when data logging is not selected for a weld, details are still recorded but then hidden from the normal data download, and not selected when the data is downloaded to a USB memory disk. To aid fault finding, all welds carried out including those “not logged” can be downloaded. The last 2000 welds are always stored in memory, even after the log has been deleted.

Purchase Date.

The date the unit was sold to the customer can be set and viewed. This allows more accurate record keeping.

Warranty Period.

The date the unit was first used can be viewed. This allows accurate control of the warranty period.

Clear Data Log.

The data log memory can be cleared by entering a password.

Information

Information about the welding unit can be viewed from the options menu. Select more options and then enter the password A I N F followed by the A Quick-Key.

The serial number and part number of the unit are shown. The calibration date and calibration period are also shown. Press the A Quick-Key and the following weld counters are shown: Total weld count, weld count at last calibration, welds done since last calibration.

Fault Finding

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

0: Weld OK
No Fault, weld completed OK.

1: Stuck button on start up
This fault shows when the power is first switched on. Either the Stop, Start, or a keypad 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 then 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.

5: Case temperature sensor fault (if fitted)
Some units have a case temperature sensor fitted to switch the unit off if the electronics become too hot. This fault will show if the sensor is faulty. Return the unit for service.

6: Case temperature out of limits (if fitted)
Some units have a case temperature sensor fitted to switch the unit off if the electronics become too hot. This fault will show if the temperature is too hot. Let the unit cool down.

7: Ambient temperature less than -40°C.
The unit has detected that the ambient temperature is very cold or the sensor has broken. If the temperature is not below -40°C then the unit will need to be returned to a service agent for repair.

Fault Finding *continued...*

8: Ambient temperature more than +600ºC.
The unit has detected that the ambient temperature sensor has broken or a wire has gone open circuit. The unit must be returned to a service agent for repair.

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 then 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 then 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, then 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 needs be try another generator.

It could be caused by the use of long extension leads. If a large fitting is welded then a high current will be taken from the supply. If extension leads are used, there will be a volts 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 then use just 15 feet of 12 AWG cable, the same size fitted to the unit.

Fault Finding *continued...*

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 then this fault will be shown. The unit needs to be returned for service.

20: Low output volts (-1.25%)
This fault will happen if the output voltage is 1.25% lower than the set point 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 needs be try another generator. It can also be caused by using long extension leads with the unit. It is recommended that only 15 feet of extension are used, and the cable should be the same thickness as the input lead on the unit (12 AWG).

21: High output volts (+1.25%)
This fault will happen if the output voltage is 1.25% higher than the set point for more than 3 seconds. It will normally be caused by a poor quality generator with the supply voltage fluctuating. Try a different generator.

22: Excess output volts (+6.25%)
This fault will happen if the welding voltage is 6.25% more than the set point for more than 2 seconds. This fault is normally caused by a fault within the unit, a short circuit triac. The unit must be returned for service.

23: Low output current (<2.5A)
This fault will happen if the welding current is below 2.5 amps for more than 3 seconds. 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.

24: Shorted turn detected in fitting.
While welding, the unit has detected a sharp increase in welding current. This is normally caused by a shorted turn happening in the fitting. (An increase of 10%). If this happens then it is most likely a faulty fitting. This must be replaced. If the fault persists then it could be a fault within the unit.

Fault Finding *continued...*

25: User stop button pressed
The operator has pressed the stop button.

26: Relay unlatched
During welding, if the main power relay disconnects then 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 then 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.

30: Bar Code Mode: No fitting connected
This fault is shown if the output lead is not connected to a fitting when a bar code is read. Connect the fitting.

31: Bar Code Mode: Ohms error
This fault is shown if the connected fitting resistance is different from that coded into the bar code. Try another fitting.

40: Bar Code Invalid: Temperature Compensation.

Digits 22 and 23 of the bar code have been decoded incorrectly.

41: Bar Code Invalid: Resistance Coefficient.

Digit 18 of the bar code has been decoded incorrectly.

42: Bar Code Invalid: Welding Voltage.

Digits 13 and 14 of the bar code have been decoded incorrectly.

43: Bar Code Invalid: Regulation Mode.

Digit 12 of the bar code has been decoded incorrectly.

44: Bar Code Invalid: Fitting Size.

Digits 9, 10 and 11 of the bar code have been decoded incorrectly.

45: Bar Code Invalid: Cooling Time.

Digit 7 of the bar code has been decoded incorrectly.

Fault Finding *continued...*

46: Bar Code Invalid: Fusion Cycle Type.

Digit 5 of the bar code has been decoded incorrectly.

47: Bar Code Invalid: Energy Correction.

Digit 3 of the bar code has been decoded incorrectly.

48: Bar Code Invalid: Component Type.

Digits 1 and 2 of the bar code have been decoded incorrectly.

49: Bar Code Invalid: Check Digit.

Digit 24 of the bar code has been decoded incorrectly.

50: USB Memory: Disc full.

This fault will happen if the USB flash memory pen is full. Delete some files from the device.

51: USB Memory: File allocation table full.

This will happen if the USB flash memory pen's file structure becomes fragmented. Follow the instructions with Windows to defragment the memory pen.

52: USB Memory: File not found.

When performing a software upgrade, the required file was not found on the memory drive. Reload the upgrade files onto the memory drive.

127: Power off failure.

If the power is turned off while the unit is welding, this fault will be recorded to the datalog.

Maintenance

Regularly check for obvious defects such as loose or damaged cords and connectors. Look for worn components and broken covers or housings.

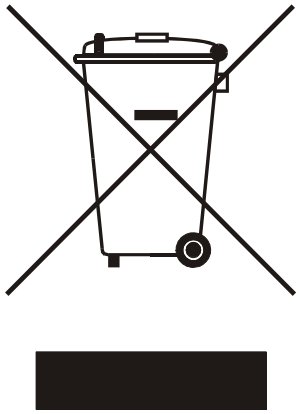
There are no user serviceable parts inside the processor. It should be returned to an approved service agent for repair and calibration.

It is recommended that the unit is calibrated every twelve months.

After use, clean the outside of the unit with a soft brush or cloth. Carefully wind up and store the cords in the locations provided in the carry case.

Disposal

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



DO NOT DISPOSE OF THIS EQUIPMENT INTO HOUSEHOLD WASTE !

According to the European Directive 2012/19/EU 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.

Calibration and Warranty

This welding processor has been manufactured, inspected and tested in accordance with ISO9001 quality control systems.

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

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

Conditions of Warranty:

This warranty covers only those defects to the product which arise from normal use of the product, and will become invalid if any of the following apply:

- Failure to follow the operating instructions.
- Improper or inadequate maintenance.
- Unauthorised modification.
- Misuse or any use not in accordance with the operating manual or good industry practice.
- Physical abuse of the product.
- Operation outside the products specifications.
- Improper site preparation or site maintenance.
- Faulty pipe or fitting.

Extent of Warranty:

Subject to the conditions and limitations of warranty; the manufacturer warrants that its electrical products will be free from defects in materials and workmanship for a period of twelve months, and its mechanical products for six months, from the date of purchase by the end-user customer.

If during this period, notice of a defect which is covered by this warranty is received, then the manufacturer will either repair or replace the product at its option. Any replacement product will have functionality at least equal to that of the product being replaced, and will in our opinion, perform consistently with its age and usage.

Calibration and Warranty *continued...*

Unless otherwise agreed, all warranty work will be carried out by the manufacturer or an authorised and approved service facility.

Customers will prepay all shipping charges for products returned under warranty, and the manufacturer will charge for return of the products back to the customer.

This warranty statement gives the customer specific legal rights. The customer may also have other rights which vary from country to country in the world.

Limitations of Warranty:

The manufacturer does not warrant the operation of any product to be uninterrupted or error free.

The manufacturer specifically disclaims the implied warranties of satisfactory quality and fitness for a particular purpose.

The manufacturer makes no other warranty of any kind, whether express or implied, with respect to its products.

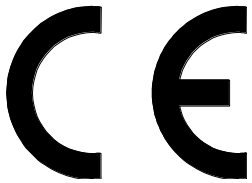
To the extent that this warranty statement is inconsistent with the law of the locality where the customer uses the product, this warranty statement shall be deemed modified by the minimum necessary to be consistent with such local law.

To the extent allowed by local law, the remedies provided in this warranty statement are the customer's sole and exclusive remedies.

This equipment has been designed for use with the range of fittings and pipe available at the time of its design and development. The manufacturer can accept NO liability for the equipments ability or otherwise to be used with new or different fittings or pipe that subsequently appear in the market place.

This equipment is not intrinsically safe and must not be used in a gaseous or explosive atmosphere. The manufacturer can accept NO liability if the equipment is used in these circumstances.

Declaration of Conformity



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

The applicable standards are:

2004/108/EC	Electromagnetic compatibility.
2006/95/EC	Low voltage equipment.
98/37/EC	Machinery safety.
94/62/EC	Packaging and packaging waste.
2008/34/EC	Waste Electrical Electronic Equipment Directive (WEEE)
2008/35/EC	Restriction of Hazardous Substances Directive (RoHS)

On behalf of
The Manufacturer: *K. Wilkinson.*

Service and repair

For service and repair, please contact your distributor.