ZURN®

CHEMICAL DRAINAGE SYSTEMS

Fusion Lock™ Welding Unit
Operating Instructions

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*Visit **www.zurn.com** for further information.*

Specifications

Operating Mode:	Zurn Fusion Lock™
Operating Language:	English (others on request)
Operating Temperature:	-4° to +104° Fahrenheit
Data Entry System:	Integrated Alpha-Numeric Keypad
Data Log Memory:	2,000 Welds (minimum)
Data Memory Download:	USB Flash Memory Drive
Input Voltage:	120 VAC +/- 20%; 96 V to 144 V
Input Current:	1 A to 10 A
Input Frequency:	50 Hz (40 to 70 Hz)
Input Power [Peak]*:	1200 [3960] W
Output Current:	15.5 A ac true rms
Output Stability:	+/- 1.5 %
Output Voltage (fitting dependent):	4 V to 52 V
Output Power:	62 W to 806 W
Power Factor:	.09 ⬚ .96
Welding Time:	Automatic: Temperature Compensated
Weight (with leads):	22 Lbs.
Size:	18" x 14" x 8"
Environmental Protection:	IP65
Input Lead Length:	15 Feet
Output Lead Length:	15 Feet

*For this equipment to operate correctly, it must be used with a minimum 4 kW power source.

Zurn has a policy of continuously improving product design, and as such reserves the right to change specifications of its products without prior notice and with impunity.

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.**

- 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 Zurn Fusion Lock™ System.

Calibration and Warranty

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

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

NAMAS is a service of United Kingdom Accreditation Service (UKAS).

This welding unit has a **twelve month** calibration and warranty period, active from the first use of the unit by the end user customer. (This date is logged by the welding unit and can be seen by entering the password SFWD in the "More Options" screen.)

Zurn cannot be held responsible for any issues, including problems with installation or leaks, that may arise due to poor quality power supplied at the job site. Zurn specifically disclaims responsibility for poor power conditions related to low quality generators or temporary power sources that are feeding multiple devises. A circuit should be used that is able to supply the required power as specifically outlined in the welder manual provided with the product. Fluctuations in voltage, amperage, or frequency may cause inadequate welder performance.

Certificate of Conformity

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

$C\epsilon$

The applicable standards are:

89/336/EEC   Electromagnetic compatibility

73/23/EEC   Low voltage equipment

98/37/EC   Machinery safety

Instructions For Use

Connect the welding unit to the correct supply voltage and switch it on. The screen will show a welcome message along with the software version and date.

The owner information is now shown on the display. (For information on how to program this into the unit, see the Calibration Manual.)

The main menu is now shown. During operation, except when welding, pressing the ★ (star) key will jump back to this menu.

Note: The operation of the unit can be customized by turning features on and off, such as data logging. This manual details all available modes and features. For information on how to customize the welding unit, see the "Passwords" section later on in this manual.

General Operation

The welding unit is fitted with an alphanumeric keypad which is used by the operator to input data. 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 phones.) Pressing the **A** key will *Accept* the data entry. Pressing the **B** key will step *Back* one position. Pressing the **C** key will *Clear* the input field.

Data Log Memory

The unit 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 in turn: Enter the required information and press the **A** key to accept it.

Note: This information will be saved when the weld has been completed and will be prompted the next time the unit is powered on.

Welding

This mode of operation is designed to weld all fittings.

From the main menu:
Press the **A** Quick-Key to select welding, then:

On Initial Power Up:
The display will ask for first, the **Operator's Name**; second, the **Location** where the weld is being done; and third, any **Information** for more detail. Enter the information as required and press the **A** key to accept it.

After Initial Power Up:
The display will ask for the output leads to be connected to the fitting.

The display will now ask what size group of fittings are being welded. 1-1/2"-4" can be welded at the same time or 6" can be welded.

The display will now ask for the START button to be pressed. Press Start to begin welding.

During the weld, the display will show the set welding time and the remaining welding time. This time will be temperature compensated according to the ambient air temperature. The unit 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.

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

Multiple Connections

The unit can weld multiple joints in series. These must be within the same size range (1-1/2"-4" or 6"), and not exceeding the numbers shown in the table below. Joints are connected in series using the link cables provided.

Multiple Connection Guide
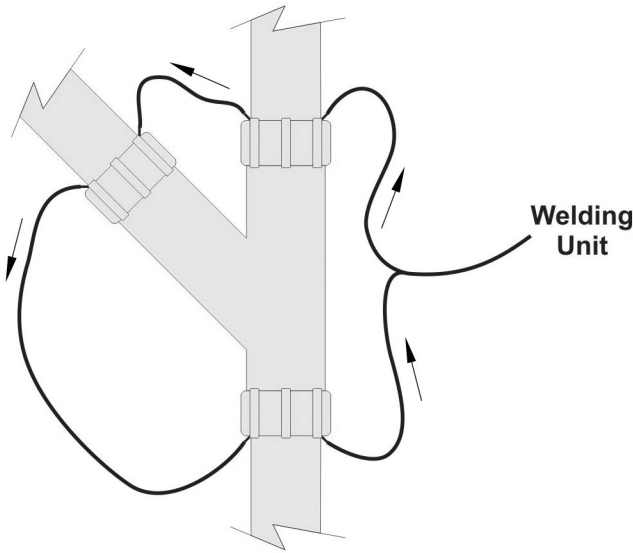
Size - Inches	1-1/2	2	3	4	6
Joints	10	8	4	3	2

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 unauthorized alteration of the information.

A download program is supplied that unencrypts the data and allows it to be viewed, filtered, graphed, and printed. This software is supplied on the USB memory pen. Run the Install file and follow the instructions.

Plug the USB flash memory drive into the USB connector on the side of the welding unit.

From the main menu:

Press the **D** *Quick-Key* to select options.

Press the **A** *Quick-Key* to select download data.

Confirm that you want to download the data. The display will show that it is "enumerating the device." While this is showing, the unit is initializing the memory drive. The data will now be downloaded.

The display will ask if you want to reset the data log memory. Select Yes or No then disconnect the memory drive when prompted to do so.

Options

From the main menu:

Press the **D** *Quick-Key* to select options.

Press the **B** *Quick-Key* to select other options.

From here the time and date can be set, along with supervisor and calibration options. These are password protected.

Passwords

The following passwords are available:

JFMA *Set the date.* The data can be set in the format dd/mm/yyyy.

ATOZ *Set the operating language.* The available languages are displayed. Press the letter shown to select the language.

AINF *Show unit information.* The serial number, part number, calibration date, and calibration period are shown. Press any key and the weld counters are shown.

SFWD *Show date of first weld.* The date that the first weld was carried out is shown. This is used to set the start of the warranty period.

AWKL *Clear data log memory.* The data log memory is erased.

SWUD *Update the software.* The internal software can be upgraded. Copy the new software onto a USB memory pen and plug it into the USB connector on the side of the box. Enter the password. When prompted, press the **A** key to accept. The software will now be updated. When completed the screen will show "Success!". Unplug the welding unit from the power supply to complete the process.

DLEN *Set download to plain text.* The data download will be a Common Separated Variable (csv) file, with an .xls extension.

AWHD *Download all welds, including non-logged.* This password will download all welds, including those done when the unit was not set to data logging mode. All visible and hidden welds are downloaded. The hidden, non-logged welds will show blank in the operator input fields.

Other passwords are available for authorized repair centers. These include calibration, changing owner details, and setting/showing the distributor selling date.

Error Codes

START-UP FAULTS

Code	Description	Cause	Remedy
1	Stuck button on startup	Start, Stop, or Keypad is stuck.	Free the stuck button.
2	Output fault on startup	Welding voltage on output lead at startup.	The unit must be returned to a repair agent.
4	No calibration	The unit requires calibration.	The unit must be returned to a repair agent.
5	Case temperature sensor fault	Case temperature thermal switch is faulty.	The unit must be returned to a repair agent.
6	Case temperature out of limits	Case temperature thermal switch has tripped.	The unit is too hot. Allow it to cool down and try again.

PRE-WELD FAULTS

Code	Description	Cause	Remedy
10	Low supply frequency <40 Hz	The supply frequency is lower than 40 Hz.	Correct the generator speed or try a different generator.
11	High supply frequency >70 Hz	The supply frequency is higher than 70 Hz.	Correct the generator speed or try a different generator.
12	High supply voltage >140V	The supply voltage is higher than 140 volts.	Correct the generator voltage or try a different generator.
13	Low supply voltage <95V	The supply voltage is lower than 95 volts.	Correct the generator voltage or try a different generator. This can be caused by long extension leads and big fittings. Try removing extension leads.
14	Relay failed to latch on weld start	The power relays did not operate correctly when weld started.	The unit must be returned to a repair agent.

Error Codes, continued

WELDING FAULTS

Code	Description	Cause	Remedy
0	No fault: Weld completed okay		
20	Welding current excessive (>150%)	The welding current is excessively high for more than 0.3 seconds.	There is a short circuit inside the unit. It must be returned to a repair agent.
21	Welding current high (>125%)	The welding current is more than 25% high for more than 1 second.	There is a short circuit inside the unit. It must be returned to a repair agent.
22	Welding current high (>112.5%)	The welding current is more than 12.5% high for more than 1.5 seconds.	This could be caused by a poor quality generator with fluctuating voltage. Try a different generator. If the fault continues, return the unit to a repair agent.
23	Welding current high (>106.25%)	The welding current is more than 6.25% high for more than 2 seconds.	This could be caused by a poor quality generator with fluctuating voltage. Try a different generator.
24	Welding current high (>101.5%)	The welding current is more than 1.5% high for more than 3 seconds.	This could be caused by a poor quality generator with fluctuating voltage. Try a different generator.
25	User Stop button pressed	The Stop button has been pressed.	The operator stopped the weld.
26	Relay unlatched	The power relays have disconnected during welding.	Try a different generator.
27	Fitting open circuit	The output lead has disconnected from the fitting during welding.	Reconnect the output lead onto the fitting. Wait for the fitting to become cool to the touch and try again.
28	Welding current low (<98.5%)	The welding current is more than 1.5% low for more than 3 seconds.	This could be caused by a generator that is too small. Try a bigger generator. It can be caused by long extension leads. Try only using 30-foot extension of the same thickness.
29	Welding current low (<50%)	The welding current is more than 50% low for more than 1 second.	This could be caused by a generator that is too small. Try a bigger generator. It can be caused by long extension leads. Try only using 30-foot extension of the same thickness. This can be caused by a faulty fitting. Try another fitting. If the fault continues, it must be returned to a repair agent.

Error Codes, continued

USB MEMORY FAULTS

Code	Description	Cause	Remedy
50	USB memory disk full	The USB flash memory pen is full.	Delete some files from the memory pen or use a different device.
51	USB memory file allocation table full	The USB flash memory pen's file structure has become fragmented.	Defragment the memory pen. Follow the instructions in Windows.

SUPPLY POWER FAULTS

Code	Description	Cause	Remedy
126	Cooling time failure	The supply power was disconnected during cooling or the cooling time was prematurely ended by the operator.	Allow the cooling time to complete.
127	Supply power failure while welding	The supply power was disconnected during welding.	Make sure the power does not turn off during welding.

Repair Information

There are no user serviceable parts inside the welding unit. If an internal fault happens with the unit it must be returned to Zurn Industries or one of its authorized service agents for repair.

For sales, service and repair:

ZURN

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