

# WVMS

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CI/SfB	(52.5)	X		
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## Electro-Fusion Welding Method Statement

### RIDGISTORM-XL

Water Management Solutions

# Ridgiform-XL Large Diameter Pipes and Fittings

## 1. Electro-Fusion Method Statement

### 1.1 Items required

#### 1.1.1 Essential

- 415v 3 Phase generator with at least 12kva (preferably 15kva) output or suitable alternative supply.
- Polypipe Electro-Fusion Control Unit (please note that the system does not work with a standard UK ECU).
- Polypipe transformer.
- Alcohol cleaning fluid.
- Dry, lint free cleaning cloths.
- An internal support ring (for sizes 900mm and above).
- An appropriately sized outer tension clamp (see separate instructions on how to prepare one if necessary).
- 6mm Allen key (size checking is recommended).
- Wrecking bar/steel bar for tightening internal brace.

#### 1.1.2 Preferable

- Clean, dry baseboard or groundsheet.
- Welding shelter.

### 1.2 Pre-joint checks

- All equipment to be clean, in good condition, regularly maintained and within calibration or service dates.
- Check that the restraining/tension clamps are in good condition.
- Ensure that the generator has sufficient fuel for the duration of the electro-fusion process.
- Do not start the process unless it can be completed in one go.

### 1.3 Do's

- Understand the electro-fusion process.
- Ensure that the operatives are familiar with the equipment to be used.
- Always use the outer tension clamping and for sizes 900mm and above, use the inner tension ring.
- Observe correct fusion and cooling times.
- Allow all of the alcohol cleaning fluid to evaporate before assembling the joint.
- Providing that the correct lifting tackle is available, consider fusing the joints out of the trench and lower the pipe into place later.
- Protect the welding area against dirt, humidity and direct sunlight. It is good practice to use a welding shelter at all times, particularly if temperatures are below +5°C.
- Use a base board or groundsheet to protect against dirt and damp.

### 1.4 Don'ts

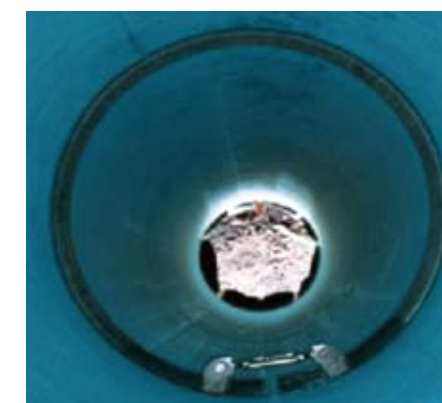
- Do not start any electro-fusion joint if it cannot be completed without interruption.
- Do not position the ECU in the trench or use it in potentially gaseous atmospheres.
- Do not use dirty or contaminated fittings.
- Do not touch prepared surfaces.
- Do not prepare fittings until immediately before they are to be used.
- Do not allow the jointing area to become wet or damp.
- Do not slacken or remove clamps until after cooling period has elapsed.

### 1.5 Jointing

- Locate the outer tension clamp into the groove around the socket end of the pipe to be welded and tighten one of the Allen bolts on the clamp bracket, just enough to hold it in place. Make sure that the clamp bracket is approximately 250mm from the element wires with the free end facing away.
- Using a suitable baseboard or groundsheet, move the pipe ends within a few feet of each other. Consider putting a board or ground sheet under the opposite end of the pipe, to simplify the next joint. Pipes up to 1200mm diameter have a single fusion element. Make sure that this is positioned in the most convenient orientation, probably at the crown of the pipe. Larger pipes have two elements and it is likely that the most convenient orientation is 3 o'clock/9 o'clock.
- In case of welding in low temperatures, assemble/place a suitably sized welding shelter over the joint area (see pic 1). For sizes 900mm and above position the inner tension ring inside the mouth of the spigot, about 50 mm from the end of the pipe and tighten by hand until it just 'nips' into place (see pic 2). Do not tighten yet. Remove the protective wrapping and inspect the pipe ends for damage (see pic 3), Measure the insert depth of the socket and mark this at intervals around the spigot and with a waterproof pen.
- Using separate clean and lint free cloths, clean the socket and spigot of the two pipes to be jointed (see pic 4). Ensure that all of the alcohol evaporates from the pipe ends. Do not touch the prepared surfaces or allow them to become dirty or wet.
- Push the spigot end into the socket, ensuring that the wire ends are not displaced. If using mechanical assistance ensure that the pipe end being pushed is suitably protected. Push the joint 'home' until the previously made pen marks 'meet' the socket. Ensure that both pipes are straight and true, with no bending.



Pic. 1



Pic. 2



Pic. 3



Pic. 4



# Ridgistorm-XL Large Diameter Pipes and Fittings

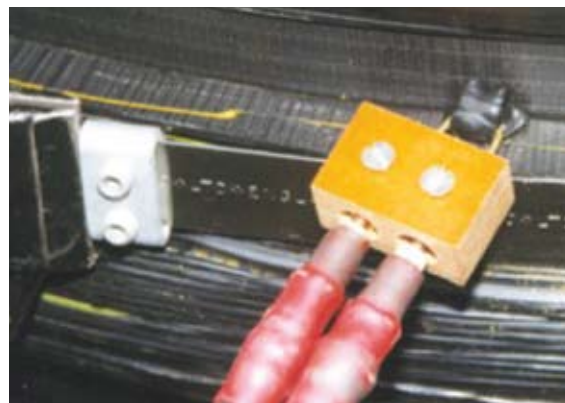
- Enter the pipe from the open end and move to the jointing area. Tap the previously inserted inner support ring to approximately 20mm from the joint and tighten using a wrecking bar or steel bar.
- 'Back off' tightening tool. Slacken the Allen bolt on the external tightening band and fit the tightening tool (see pic 5). This is done by slipping the free end of the band into the 'nose' of the tool and also into the centre jaw section. Slide the tool along the free banding end until the nose pushes against the clamp bracket. Push the tool towards the pipe so that the short clamping cover is pressed against the pipe which causes it to 'nip' the tightening band. Alternatively, hold the lever with one hand and tighten with the other. Tighten the tool (see pic 6). Once it has gripped the band, the tool can be moved away from the pipe to facilitate tightening.
- Finally, tighten the Allen keys to avoid slippage. If a fitting or short length of pipe is being welded restrain it so that there is no possibility of moving during the welding process. On pipes 1500mm and above, the two welds can be done consecutively or simultaneously if two Electro-Fusion Control Units (ECU's) are available.
- Trim the wire element ends to approx 80mm/3" and connect the adaptor. Connect the terminals of the Electro-Fusion Control Unit (ECU) to the adaptor (see pic 7). The terminals can be fitted either way. Ensure that the weight of the leads does not twist or bend the wire element ends towards each other, causing a short-circuit. Position the ECU out of the trench and away from gaseous atmosphere.
- Plug the ECU into the transformer and the transformer into the generator or other 415v three phase supply. Start the generator, allow to stabilise and turn on the ECU. The generator should be positioned so that exhaust fumes do not enter the trench.



Pic. 5



Pic. 6



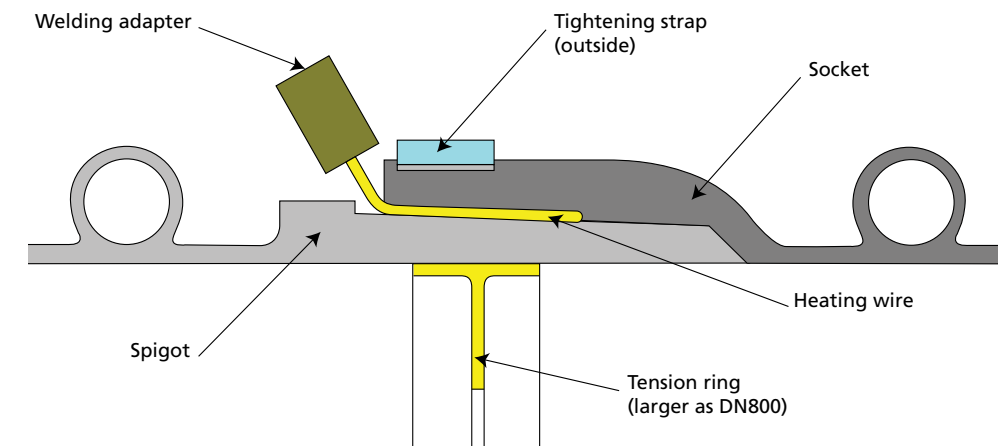
Pic. 7



Pic. 8

- Enter the welding parameters into the ECU by scanning the label on the joint with the barcode wand (see pic 8). Pass the wand over the barcode quite briskly. The machine will beep, please note that tones may vary. Ensure that the reader wand is replaced in its sheath for protection.
- Check that the screen shows the correct welding parameters and if so, press the green button to accept.
- The ECU asks if the pipe has been scraped. Press the green button for 'yes' (see separate note for info). Welding will now start. Do not allow the pipes or equipment to move during the fusion process.
- At a point between 50% and 75% of the welding time retighten the outer tension band, not forgetting to loosen and retighten the Allen bolts.
- When the fusion time has finished the ECU will beep. Wait for 10 minutes before the terminal ends are removed or disturbed. Allow the joint to cool for another 40 minutes before the internal and external clamps are removed.

## 2. Welding Parameter for Electro-Fusion Socket



Welding parameter for electro-fusion socket				
Diameter	Voltage	Time in sec. at one spiral	Voltage	Time in sec. at two spirals
DN750	25 volt	20 mins	-	-
DN900	39 volt	12 mins	-	-
DN1050	40 volt	20 mins	-	-
DN1200	43 volt	21 mins	-	-
DN1500	-	-	32 volt	17 mins
DN1800	-	-	40 volt	15 mins
DN2100	-	-	39 volt	21 mins

Preparation time	Cooling time
10 mins	40 mins

Please note: Times stated above are approximate only. Visible sign of welding completion is the melting plastic protruding from the socket towards the welding wire

# Electro- Fusion Welding Method Statement



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