

# AquaGrip



## Flange Adaptor - 225mm to 900mm

INSTALLATION INSTRUCTIONS – GB



PIPE CONNECTIONS • REPAIR • FLOW CONTROL PRODUCTS



# AQUAGRIP FLANGE ADAPTORS

## Sizes 225mm to 900mm

**Note:** For certain pipe sizes/SDR ratings and/or installation in cold weather conditions it is necessary to use heating mats to pre-warm the PE pipe prior to installing the AquaGrip Flange Adaptors. Please consult the tables below for guidance on the pipes that will require heating mats and the heating mat specifications by pipe size. For further information please contact the Viking Johnson Marketing Department.

**Table 1: Details of where heating mats are required**

A = Heating Mats required if temperature of the bore to the pipe falls below -5°C

Required = Heating mats are required in all temperatures

PIPE OD	SDR RATING			
	11	17 / 17.6	21	26/33
225	A	A	A	A
250	A	A	A	A
280	A	A	A	A
315	A	A	A	A
355	A	A	A	A
400	Required	A	A	A
450	Required	A	A	A
500	Required	A	A	A
560	Required	A	A	A
630	Required	A	A	A
710	No Product Available	Required	A	A
800	No Product Available	Required	A	A
900	No Product Available	Required	A	A

**Note:** Although some PE Pipe diameter, SDR Rating or actual bore temperature at the time of installation do not require the use of heating mats it may be a requirement of the contract or water utility specification that they are used. Viking Johnson recognises that the use of heating mats on any size and temperature will improve fitment of the AquaGrip flange adaptor and recommend checking to see if this is a requirement.

**Table 2: Heating mats temperature and timings**

PIPE OD	mm	250	315	355	400	450	500	560	630	710	800	900
<b>TOTAL LENGTH</b>	mm	785	989	1115	1256	1414	1570	1759	1979	2230	2513	2827
<b>MAT WATTAGE</b>	W	870	1095	1230	1392	1566	1740	1940	2190	2470	2783	3131

Minimum Bore Temperature of the PE pipe at end of heating time = 40°C

Maximum bolt up time after removal of heating mat = 30 minutes

Minimum generator power = 5kVA

# FITTING INSTRUCTIONS FOR AQUAGRIP WITH HEATING MATS



## Pipe end preparation – See figure 1 below

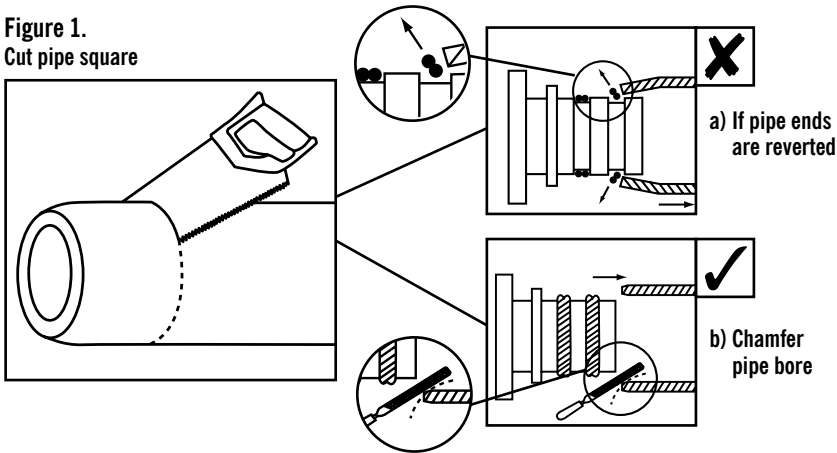
- Cut off a short section of the pipe end to remove reversion ensuring cut is square within 10mm to the pipe axis.
- Chamfer the bore typically 6mm x 45° to assist entry of the fitting in to the pipe.
- Check that the bore is free from score marks and contamination to a minimum distance of 500mm from the pipe end.

**Note:** If the AquaGrip is being installed on:-

- PE pipes that use a sacrificial or peelable protection layer on the external surface of the pipe (e.g. ProFuse, SecuraLine pipe) then ensure this outer layer is removed before installing the AquaGrip fitting.
- PE pipes with a co extruded colour layer that is homogeneous with the pipe and is the correct outside diameter for the AquaGrip, these should not have the colour layer removed prior to installation.

**Figure 1.**

**Cut pipe square**



## Preparation of assembly

- Check that the fitting is the correct size and SDR rating for the pipe
- Check that all assembly kit is present: Pneumatic gun, air supply, 110v electricity supply, heating mats, temperature gauge and probes, Torque wrench, Socket and extension, lifting equipment, lubricant, tape, file, cleaning materials etc.

## Installation of clamp bands

- Place the clamp bands loosely over the pipe with a minimum of 1 bolt to join each butt. It is sometimes easier at this stage to use only the bolt furthest away from the pipe end to later allow the easier placement of the anchor shoulders over the anchor ring of the body.
- Slide the loose clamp bands away from the pipe end temporarily.

## Fitting of the heating mats – If required consult table 2 on page 2

- Fit the correct size heating mats flush to the end of the pipe ensuring that the thermocouple is placed under the middle of the mat and that there are no gaps between mat and pipe OD. DO NOT OVERLAP THE MATS AS THIS CAUSES OVER HEATING.
- Connect a second thermocouple to the bore of the pipe using tape approximately 300mm from the pipe end (see figure 2).
- Connect the heating mats to a 110V generator of the correct power for the mats.

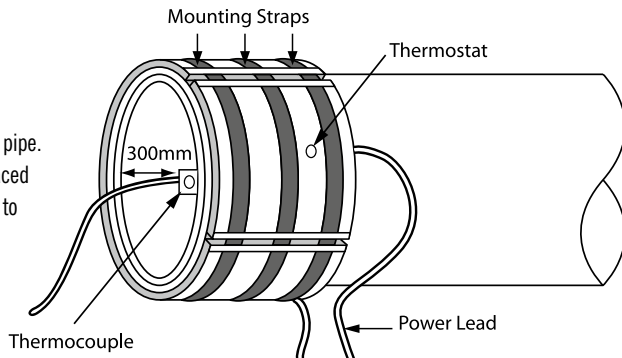


## Heat pipe

- Start generator and turn on supply to mat. Check that the temperature is rising.
- The thermostat on each of the mat panels is factory set to 80° C and the mat temp should be maintained between 70° C and 90° C
- Continue heating until the pipe bore temperature reaches a minimum of 40° C max 50° C.
- When the minimum pipe bore temp is reached remove the thermocouple from the pipe bore. Keep the heating on at this stage.

**Figure 2.**

Placement of heating mat on PE pipe.  
NB. Thermocouple should be placed on heating side of the mat close to the thermostat.



## Fitment of flange adapter body. – See figures 3, 4 and 5

- While the heating is still on check that the pipe is round to allow for easy insertion of the flange adapter then lubricate the flange adapter body gaskets with WRAS approved lubricant.
- Using suitable lifting equipment, insert the flange adapter body into the pipe bore and ensure the body is fitted square to the pipe.
- Insert the body until the anchor ring is no more than 40mm away from the PE pipe end. If required the anchor ring can be butted against the pipe end but this may inhibit the later removal of the flanged fitting that the AquaGrip is connected to.
- Make sure that the 2 gaskets are not dislodged during this insertion.
- Where applicable loosely fit flange gasket and connecting bolts.

**Figure 3.**

Lubricate gaskets with WRAS approved lubricant

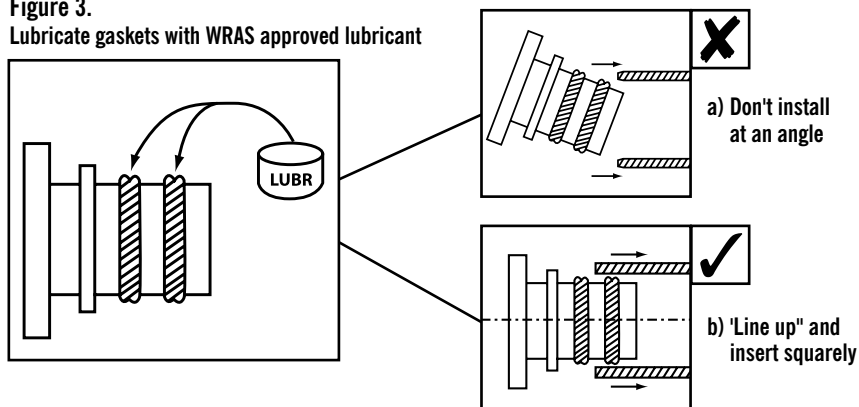




Figure 4. Loosely fit flange gasket and connecting bolts.

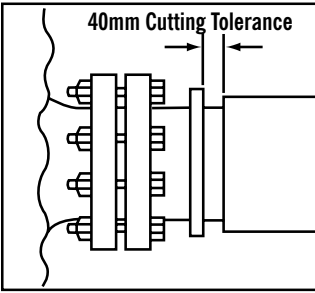
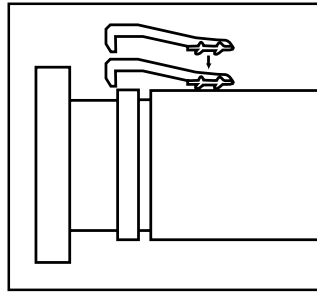


Figure 5. Loosely fit clamp bolts. Washers and nuts.



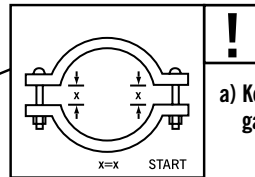
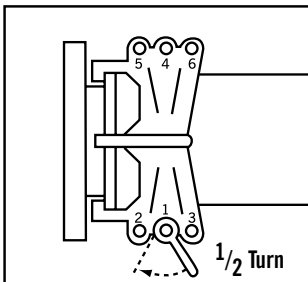
**Removal of mats and placement of clamp bands. Tightening of the clamp band bolts.**  
(This part of the process must be completed in 30 minutes MAX)

– See figures 6 and 7 for tightening procedure

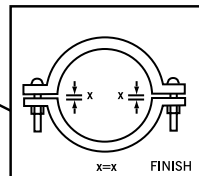
- Disconnect power supply to heating mats and remove heating mats and note the time.
- Slide the clamp band ring toward the FA body into position with the anchor hooks on the clamp bands located over the anchor ring of the FA body. Ensure the clamp band anchor hooks are in close proximity to the back face of the anchor ring.
- Note: The initial use of a pneumatic impact wrench can accelerate the assembly process. Torque wrench must be used at the final bolting.
- Working round the clamp band tighten the centre bolt at the joint between each segment by 2 or 3 turns at a time checking all segment gaps are kept the same and the FA body is held in the correct alignment.
- Once the tightening of the centre bolt becomes difficult take up the slack on the remainder of the bolts. Work round the fitting and tighten all clamp band bolts by  $\frac{1}{2}$  turn at a time, maintaining a uniform gap between the segments. On no account should the clamp band segments physically touch each other during the assembly procedure.
- During the latter stages the torque wrench must be used to ensure that the correct torque is achieved on all bolts.
- To check the correct tightening the torque wrench should register the correct torque with no turning of the nut on every bolt. If one or more nuts turn then the torque process must continue again until all nuts register the correct torque without turning.

The assembly time after the mats are switched off should be no more than 30 minutes.

Figure 6. Tighten  $\frac{1}{2}$  turn (123, 123, 456, 456, 123...)



a) Keep butt gaps even



b) Maintain even gap



Figure 7a. Not finished! 'Keep Tightening'. On all bolts!

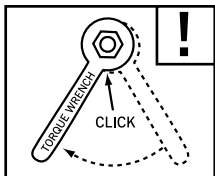
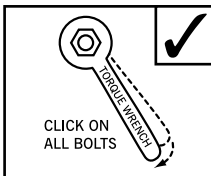


Figure 7b. Tighten now complete



Torque Table

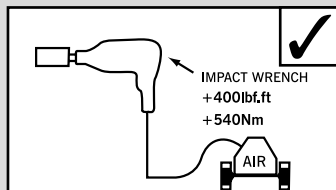
SIZE	BOLT SIZE	TORQUE RATING
315 - 400mm	M20	140-160 lbf.ft (190-215Nm)
450 - 800mm	M27	260-300 lbf.ft (350-405Nm)
900mm	M33	500-550 lbf.ft (675-750Nm)

Figure 8. Tighten Flange connecting bolts

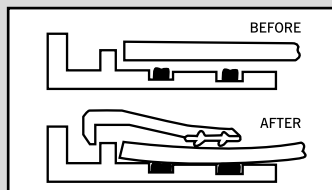
FOR YOUR INFORMATION

8. Sizes 450mm and above

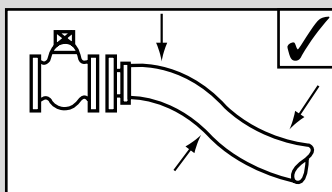
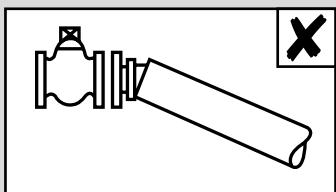
Contact Viking Johnson Marketing Department for further information on suitable tooling.



9. Before and after. PE pipe diameter reduction during assembly



10. Use pipe flexibility for alignment



AQUAGRIP CAST CLAMP BANDS Using Heating Mats (TROUBLE SHOOTING)

1) THE MAT WILL NOT HEAT UP

1a) Power supply

Check generator supply is set to 110 V and switched on. Check generator output meets minimum requirement for mat (See Table).

1b) Damage

Check mat for damage: burnt areas, puncture damage, frayed power lead etc Do not use if elements/leads are exposed.

1c) Check mat circuit continuity.

The mat has a thermal fuse set to 120° C and this will blow if the mat becomes overheated. If the circuit is broken return the mat for repair.

2) THE MAT IS GETTING HOT BUT DOES NOT REACH TEMPERATURE

2a) Cold days & high winds

If the ambient temperature is below 5° C, allow extra heating time. Shelter the pipe end from strong winds as these may reduce the effectiveness of the heaters.



## 2b) Rain

The mats are splash proof but are not designed to work in very wet conditions.

If they are steaming it is an indication that there is too much surface water on the pipe/mat. They will not reach temperature if they are using energy to heat water instead of the pipe.

Protect the mats from rain during the heating operation with a tarpaulin suspended over the pipe end (not directly in contact with the heating mat).

## 2c) Check the elements

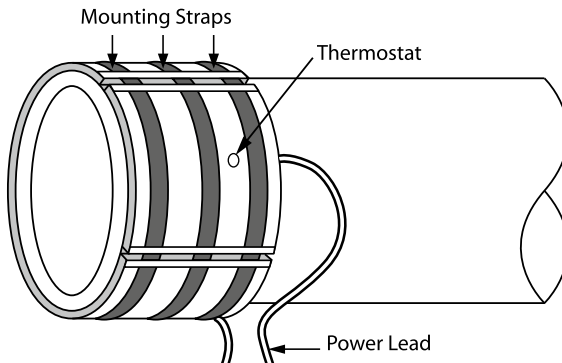
Turn off mat and remove it from the pipe. Lay it out flat with the heating side uppermost and turn it on. The elements should be visible as a pattern of dark lines on the mat surface when the mat heats up. The spacing between the elements should be even but larger gaps indicate that one or more elements have been damaged. The mat should be able to operate with only 2 out of every 3 elements working. If more elements are damaged return the mat to VJ for replacement.

## 2d) Is the thermostat working?

There is a thermostat mounted on the mat in the small block next to the powerlead connection. It should be possible to hear this clicking periodically as it switches in and out. Low temperature may be caused by it cutting out too soon.

Place the thermocouple on the heating side of the mat near the thermostat and monitor the maximum temperature reached before the thermostat clicks off.

If it is below 70° C then there is a fault with the thermostat. Return the mat to VJ.



## 3) THE MAT GETS TOO HOT

Temperature rises to over 90° C – TURN THE MAT OFF

### 3a) Is the mat in full contact with the pipe?

Check location of thermocouple. If the mat is not in full contact with the pipe it is possible for the mat to reach a higher temperature locally. Ensure the mat is a snug fit all around the pipe. Restart the heater and monitor the temperature.

Relocate the thermocouple to another spot to confirm the mat is at an even temperature.

### 3b) Is the thermocouple working correctly?

Check the thermocouple/display meter. Measure temperature using an alternative means to ensure the thermocouple is not giving a false reading.

If the problem persists return the mat to Viking Johnson.



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