



INSTRUCTIONS BOOKLET
FOR INSTALLATION, USE AND MAINTENANCE

STORAGE CALORIFIER

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Dear Customer,

Thank you for choosing a Storage Calorifier by VERSOL GROUP.

In your interest and to maintain the highest level of performance and life of your appliance, we recommend that you follow the instructions contained in this booklet and have regular maintenance performed by qualified personnel.

We would like to remind you that failure to follow the instructions contained in this booklet may invalidate the guarantee





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GENERAL NOTES

1.1 DESCRIPTION

This manual covers the installation, Operation & Maintenance of VERSOL Storage Calorifiers under VERSOTHERM range. These instructions should be read and understood prior to commencing with the works and during the operation of the units

1.2 SAFETY

Operators installing the equipment should be given adequate training prior to installation works. Correct PPE should be worn to ensure safety whilst operating on the units. All works undertaken as listed below shall be the responsibility of the contractor.

OFFLOADING, LIFTING AND SITING PROCEDURES

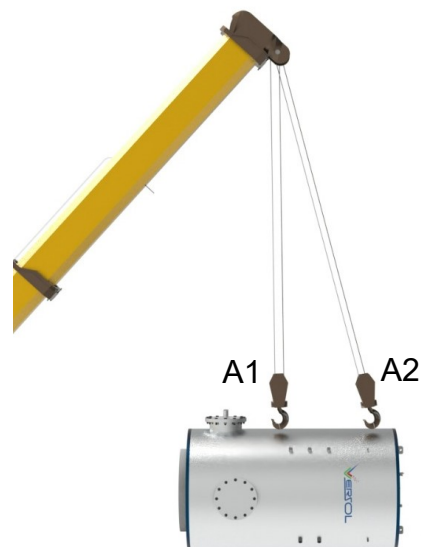
2.1 OFFLOADING

The VERSOL Storage Calorifiers shall be lifted and moved using the lifting lugs provided on the Calorifier shells. Prior to offloading or removing, the units should be inspected to ensure no damage has occurred during transit. Care should be taken not to damage the insulation cladding while offloading and moving the units.

Once offloaded, the units should be inspected to ensure no damage and all items are supplied as ordered.

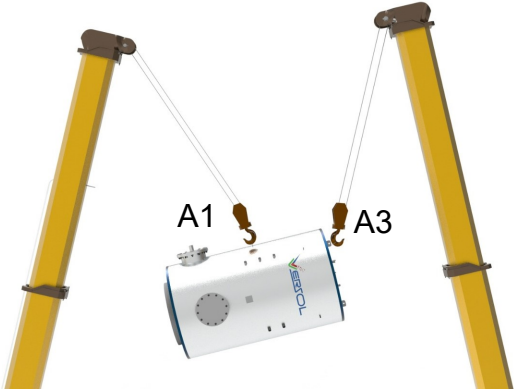
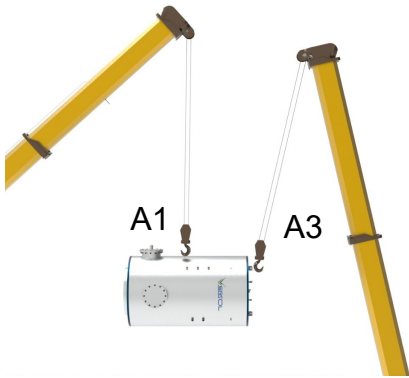
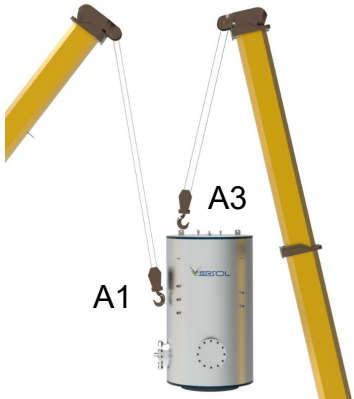
The units can be stored as it is either Vertical/Horizontal till transported to the plant room or can be shifted to its original orientation before shifting which ever suits site conditions.

Connect straps "A1 and A2"
Unload with the supporting base frame



2.2 LIFTING

Use lifting eyes where fitted. Do not lift a Calorifier using the insulation (if fitted). Straps may crush the insulation. The shell of the Calorifier may be made of relatively light gauge metal and care should be exercised when handling and moving the unit not to damage the shell. Do not lift the Calorifier using chains directly in contact with the shell. Do not allow operatives to stand on the Calorifier

<p>1. Connect straps "A1 and A3" Gradually lift "A1 and A3" 1 meter Height</p>	
<p>2. Slow lift "A3 and A1"</p>	
<p>3. Make vertical position and remove the base frame</p>	

2.3 SITING

Unless specifically ordered for an external installation, the calorifiers must be sited indoors.

Foundations or plinths must be firm and level to prevent settling, pipe strain or distortion of the shell.

Unless specifically ordered differently, the vessel must be installed in a level position.

Calorifier shall be shifted to plant room and place on the plinth carefully.

Calorifier and other equipment should at least have a minimum 500mm distance gap in between each other for future maintenance and servicing.

Calorifier with a removable tube heat exchanger, burner or electric heater should at least have a minimum 1500mm distance gap in between other items for future maintenance and servicing.

GENERAL CHECKS PRIOR TO INSTALLATION

3.1 GENERAL

Protective covers and plugs may be fitted to connections to protect them in transit. These must be removed prior to use.

If a connection is not required, seal it appropriately.

Check for any foreign material which may have got into the vessel.

Pipework connected to the vessel must be adequately supported to prevent any loads being transmitted to the vessel.

Provide for thermal expansion with bends and expansion joints

3.2 HEATER BATTERY/INTERNAL HEAT EXCHANGER (OPTIONAL)

The Heater Battery under VERSOHEX range are tested before leaving the factory and are ready for installation.

The Heater Battery is tested for the performance and the pressure rating as mentioned in the test report & name plate.

Customer need to make sure the pressure rating to the unit is not exceeding the same. The unit is ready to connect to the field pipes, either through 3 way or 2 way control valves, as suggested by the system designer.

Please make sure to arrange the NRV and IV wherever recommended.

Inlet connection shall be at top side and Outlet at bottom side. This is to make sure additional back pressure due to Thermo siphon.

For Steam Heating, the unit shall be connected with Steam Trap at return line (bottom connection).

This is highly recommended to avoid more water volume inside the heat exchanger tubes, which can reduce life time of the coils.



3.3 IMMERSION HEATER

VERSOHEX IM immersion electric heaters are tested before leaving the factory and are ready for installation.

The immersion heaters are thoroughly dried prior to dispatch but moisture may collect in the heater during transit or site storage.

It is important that prior to connecting the heaters to the mains, an insulation test must be made across each element to earth.

If the insulation resistance is less than 50,000 Ohms, the heaters must be dried out prior to connection.

This can be done by placing the heaters in a low temperature oven or by passing a low voltage (maximum of 25% of the working voltage) through the elements in open air to a maximum temperature of 60°C.

The heaters should be switched off at regular intervals to prevent overheating. For further instructions on the immersion heater, refer to separate literature.



3.4 CONTROLS

Prior to commissioning and wiring to the immersion heaters/control valves, check all the control circuitry and main circuit connections are tight using the appropriate tools.

Remove all loose items from inside the panel and other items that may be fastened to the cables.

The equipment must be connected to a suitable power supply in accordance with local regulations and the wiring diagram supplied.

To avoid damage to the electric immersion heater elements do not allow electric immersion heaters to be run dry.



INSTALLATION

4.1 The calorifiers should be installed in a suitable position to ensure maintenance can be carried out On the Calorifiers.

Adequate space should be allocated around the calorifiers to ensure suitable access to the inspection opening, control panel and also to withdraw the immersion heater from the calorifiers.

Calorifier spacing to other equipment should at least have a minimum 500mm distance gap in between each other for future maintenance and servicing.

Calorifier side where there is a removable tube heat exchanger, burner or electric heater should at least have a minimum 1500mm distance gap in between other items for future maintenance and servicing.

4.2 The unit should be flushed prior to connecting of pipe work, valves and ancillaries.

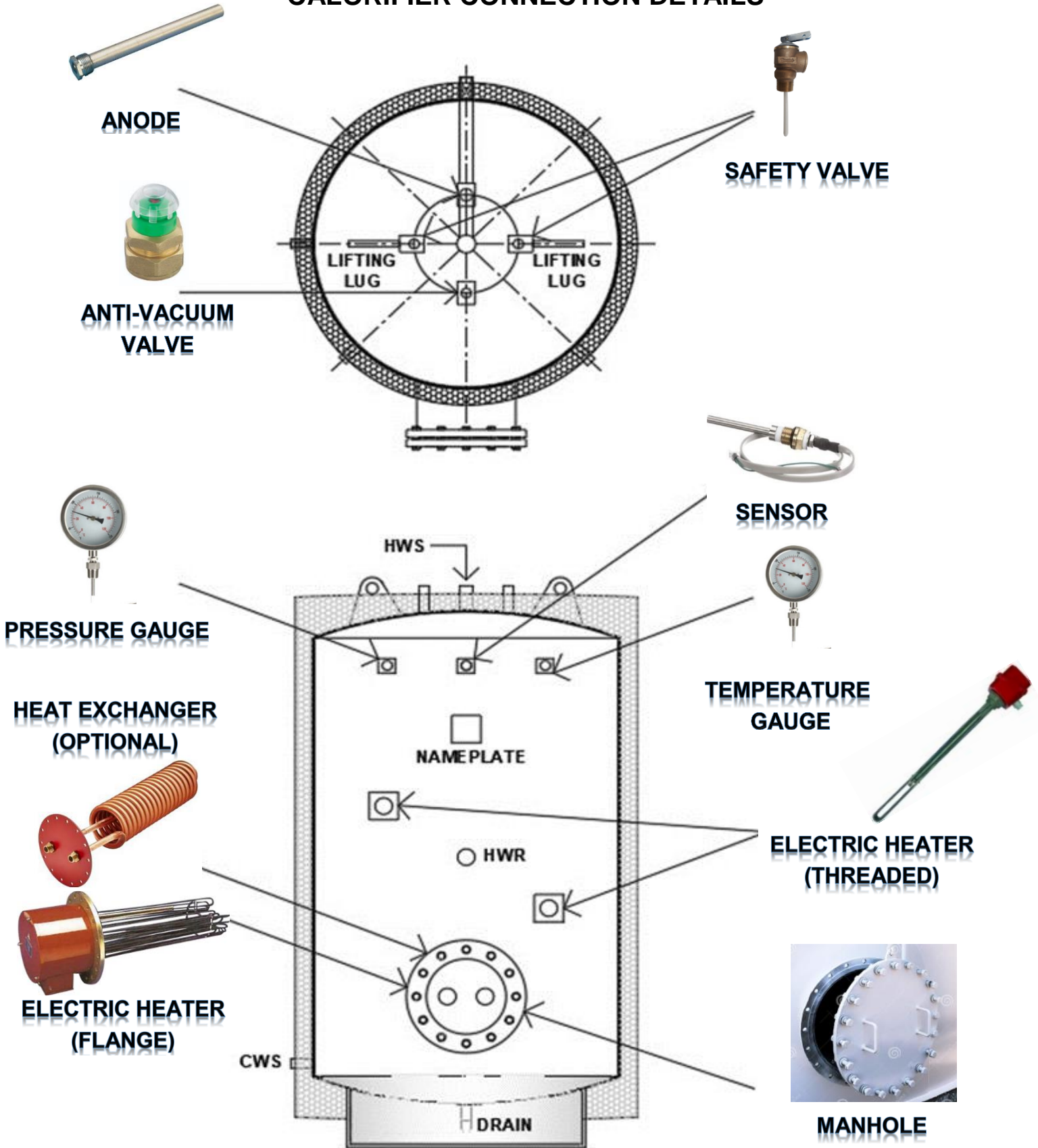
4.3 Fit isolation valves prior to the vessel connections to facilitate servicing (NOT TO THE VENT).

For flanged connections, tighten bolts in a diametrically opposite sequence to load the flanges evenly onto the gasket. Ensure adequate venting for air removal during filling and operation (pressurized systems should have an automatic air vent and a manual air vent for this).

Safety valves should have their discharge pipes away to a safe disposal point, preferably via an air-break and tundish so that the discharge unrestricted and easily visible.

Water expansion must be accommodated by a separate expansion vessel fitted in the system.

CALORIFIER CONNECTION DETAILS



COMMISSIONING AND OPERATION

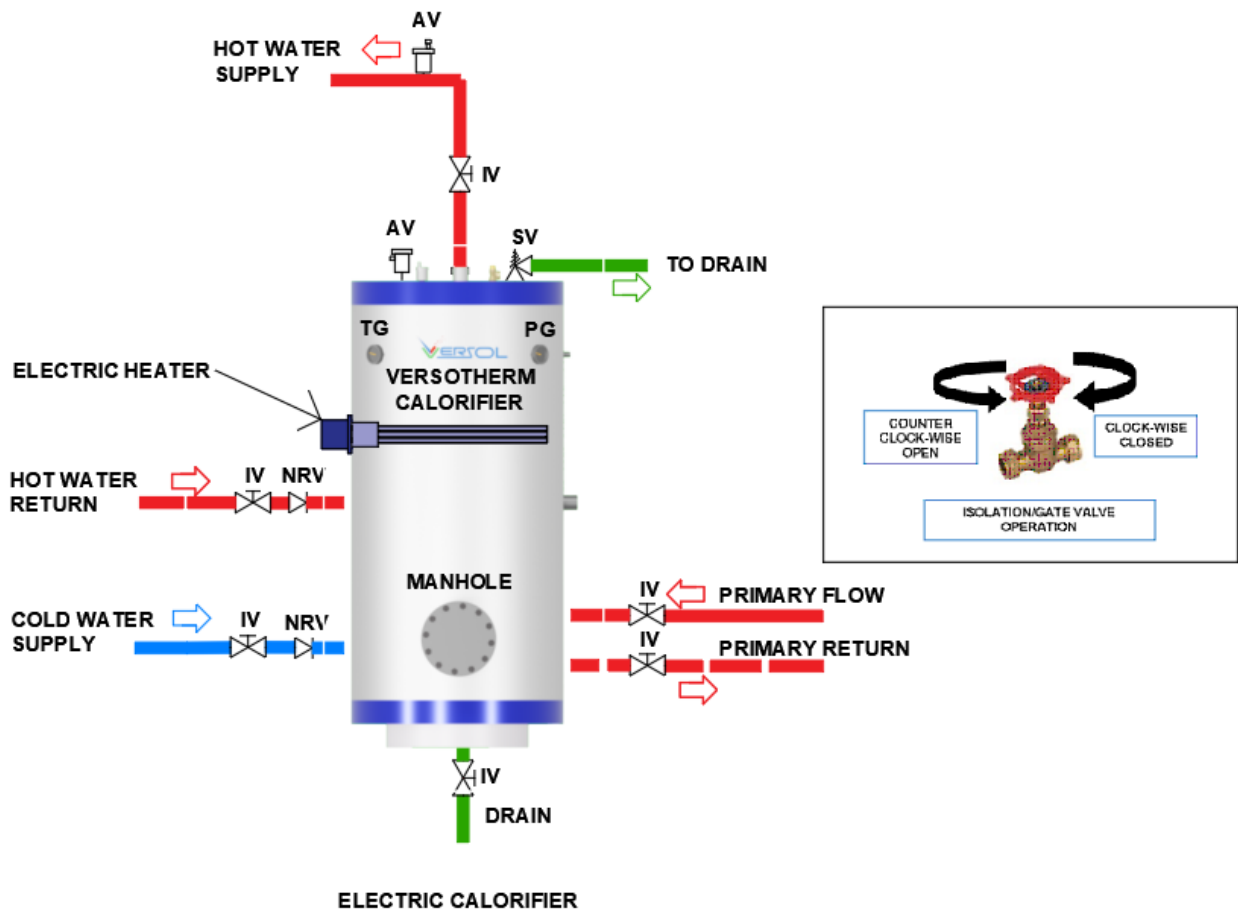
5.1 Do not operate the equipment at pressures or temperatures in excess of those specified on the nameplate of the vessel marking.



Allowable Pressure

Do not subject the equipment to conditions of vacuum or partial vacuum. This is particularly vital for copper-lined steel calorifiers, which are supplied complete with anti-vacuum valve which must not be removed from the unit.

For example partial vacuum can be caused if the cold feed or the vent are restricted during draw off or drain down.



5.2 It is assumed here that the secondary pipe work is already full of water.

5.3 For sealed systems it is assumed here that any cold water booster set and/or pressure reducing valve is already commissioned and set to the correct pressure.

5.4 Start with hot water supply, hot water return, cold water supply and primary inlet and outlet valves closed, and domestic hot water return pumps & primary circulation pump (if any) at off state.

5.5 Make sure primary circulation pumps (if any) and building hot water return pumps are ready to turn on from main control panel with verified rotation.

5.6 For sealed systems ensure auto-air vent is operational.

5.7 Make sure control Panel is in off position.

5.8 Start with filling of primary pipe line, open the primary side isolation valves for primary inlet and outlet and feeder line cross check gauge for rated pressure in pipe line.

5.9 Make sure safety valve, expansion vessel and air vents in the primary line are operation, keep the primary circulation pumps in off position.

5.10 Start filling of Storage Calorifier, close the drain valve (if open), Open the hot water supply, hot water return and hot water supply isolation valves.

5.11 Make sure anti vacuum valve and safety valve installed in the storage calorifier are operational.

5.12 Make sure air installed in the storage calorifier hot water supply main header are operational.

5.12 Open the safety valve lever manually while filling the storage calorifier until water discharges from the safety valve on the top connection, close safety valve and cross check gauge for rated pressure in vessel.

5.13 Switch building hot water return pumps power on.

5.14 When the calorifier is full, it is ready to start heating.

5.15 For electric heater heating - switch on the power to the calorifier control panel and turn the panel switch to auto (Please note all necessary checks and operation of the panel and heaters has been carried out in the factory prior to delivery with suitable certification issued with the unit).

Allow the unit to heat up.

Adjust the temperature control gradually and ensure that the correct operating temperature is maintained by it.



5.16 For heater battery heating - Switch on the control panel and ensure the temperature sensor is operating.

5.17 Make sure associated primary heating medium and primary circulation pump is working as per requirements.

5.18 Allow unit to heat up slowly. Adjust the Thermostat to control the water temperature and ensure it is operating at set temperature.

5.19 Check that all gaskets are effective when the unit is operating - some bolt tightening may be necessary after the unit has been first heated and subsequently from time to time.

Following installation and commissioning it is advisable to remove, clean and re-assemble any strainers.

Fluids must be drained when the unit is out of operation to prevent freezing or possible corrosion



MAINTENANCE

6.1 The VERSOL Storage Calorifier is designed to operate efficiently with a minimum of attention. A regular maintenance program will ensure continued high operating efficiency and trouble-free operation. Annual maintenance should include cleaning debris from the base of the calorifier to comply with guidelines on prevention of legionella bacteria proliferation. Also the site insurers may require annual inspection of heat exchanger and calorifier shell condition.

6.2 - It is recommended that a set of gaskets be carried for use when the unit is stripped down for insurance inspection, or cleaning.

6.3 - Maintenance of the pump and other ancillary equipment should be carried out in accordance with the instructions supplied for these items by their respective manufacturers. Copies of these are included with these instructions.

6.4 To drain the Vessel,

6.5 Obtain a complete set of replacement gaskets from VERSOL local Representative.

6.6 For sealed systems reduce the residual calorifier pressure by manually operating the safety valve - some hot water will come out.

6.7 For sealed systems open a manual vent valve to allow air in during drain-down.

6.8 For copper-lined steel Calorifiers ensure that the anti-vacuum valve is not stuck shut - also ensure that a vent is available at the top of the calorifier of flow area at least one half the flow area of the drain connection.

Remove one of the fittings on the top of the calorifier if necessary to achieve this. Partial vacuum, caused by inadequate venting of copper-lined Calorifiers during drain-down, will cause damage to the thin copper lining.

6.9 If the calorifier is open vented and shares a vent with other Calorifiers, isolate it from the common vent using the 3 way valve (it will now vent to atmosphere). Pipe the drain to a drain point and open the drain valve.

The calorifier shell internal condition can be inspected by removing the inspection cover to allow visual examination.

6.10 It is assumed here that all isolation valves (except drain) are open at the start.

6.11 Isolate the primary fluid inlet and outlet - switch off primary pump and heating medium if necessary.

6.12 Switch off secondary system return pump and isolate secondary return to calorifier

6.13 Isolate the secondary flow

6.14 Isolate the cold feed

6.15 Re-fit new gaskets and re-fill the Calorifier according to the commissioning instructions above.

Constant circulation through the VERSOL heat exchanger minimizes fouling. However, a clean heater gives maximum efficiency and capacity, and it is much easier to clean tubes with a light coat of scale, than it is to clean tubes which have been permitted to get excessively fouled.

The VERSOL should be cleaned periodically to ensure maximum efficiency.

Higher operating temperatures cause scale to accumulate in the heat exchanger more quickly than lower temperatures.

Hard untreated water causes much faster scale accumulation than treated water. Cleaning frequency will be determined by experience.

Check the thermostats every 12 months by removing and testing the contact resistance and comparing the switch point by immersion in hot water using a separate thermostat.

Cleaning of Heat Exchanger:

Because u-tube bundles are fairly tightly packed, chemical cleaning, e.g. using a suitable solution containing inhibitors to protect the metal, will generally give the best results.

Take care that the chemicals used will not cause any adverse or hazardous reaction with the materials of the tube bundle or the deposits being cleaned.

Drain as above. Allow primary pipe work to cool to a safe temperature.

a) Cleaning in Place (CIP)

Disconnect and remove the integral circulation pump and the secondary pipe work above the heat exchanger.

Take care not to damage any control capillary tubes.

Connect CIP hoses directly to the heat exchanger and circulate cleaning chemicals as necessary.

Do not exceed normal heat exchanger flow-rate by more than 50%.

Fully remove all traces of cleaning chemicals by flushing with fresh water after the CIP process.



b) If the heat exchanger tube bundle is to be removed for chemical cleaning.

Disconnect primary pipe work and remove primary header (The tube bundle may be heavy).

Ensure that adequate facilities are available to withdraw the bundle without distortion or damage
(Avoid damaging surfaces of flanges).

When lifting or working on the tube bundle support it by the tube plates and the support plates ideally on wooden blocks cut to fit the curvature of the tube bundle.

The tube bundle must not be supported on the tubes.

Do not bend or distort supports and baffles.





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