

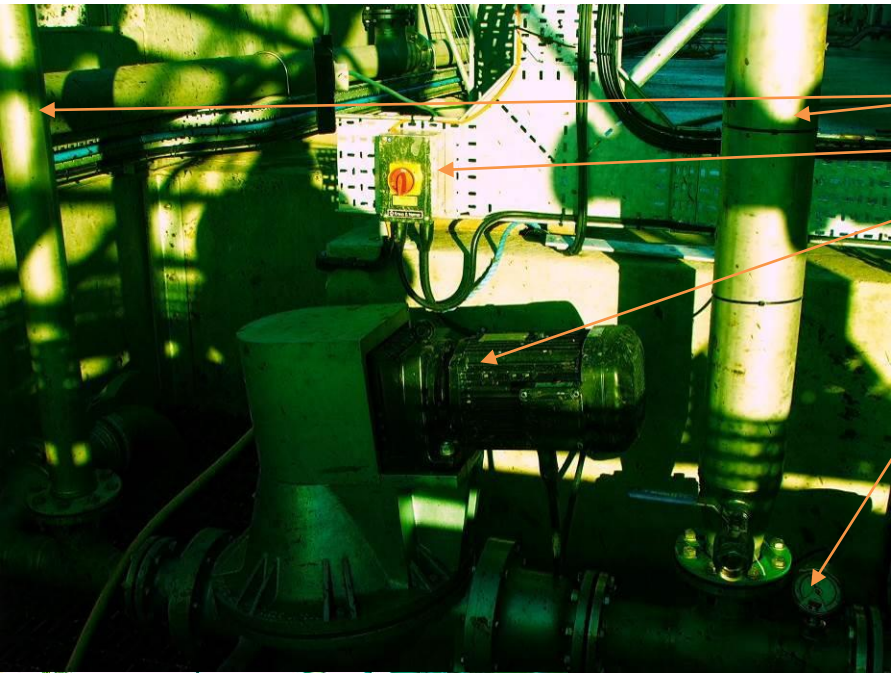
Section 5

Glossary of Fre-energy digester components

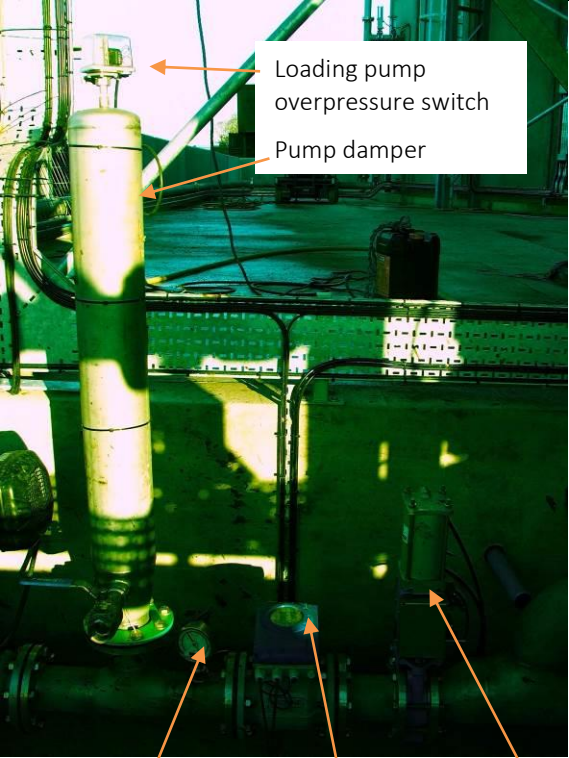
5.1 Mixing Pit pump and pump sump



Loading Pump – Energy Mallard Ram Pump



- Pump Dampers
- Pump Isolator
- Loading pump
- Pump pressure monitor



- Loading pump overpressure switch
- Pump damper

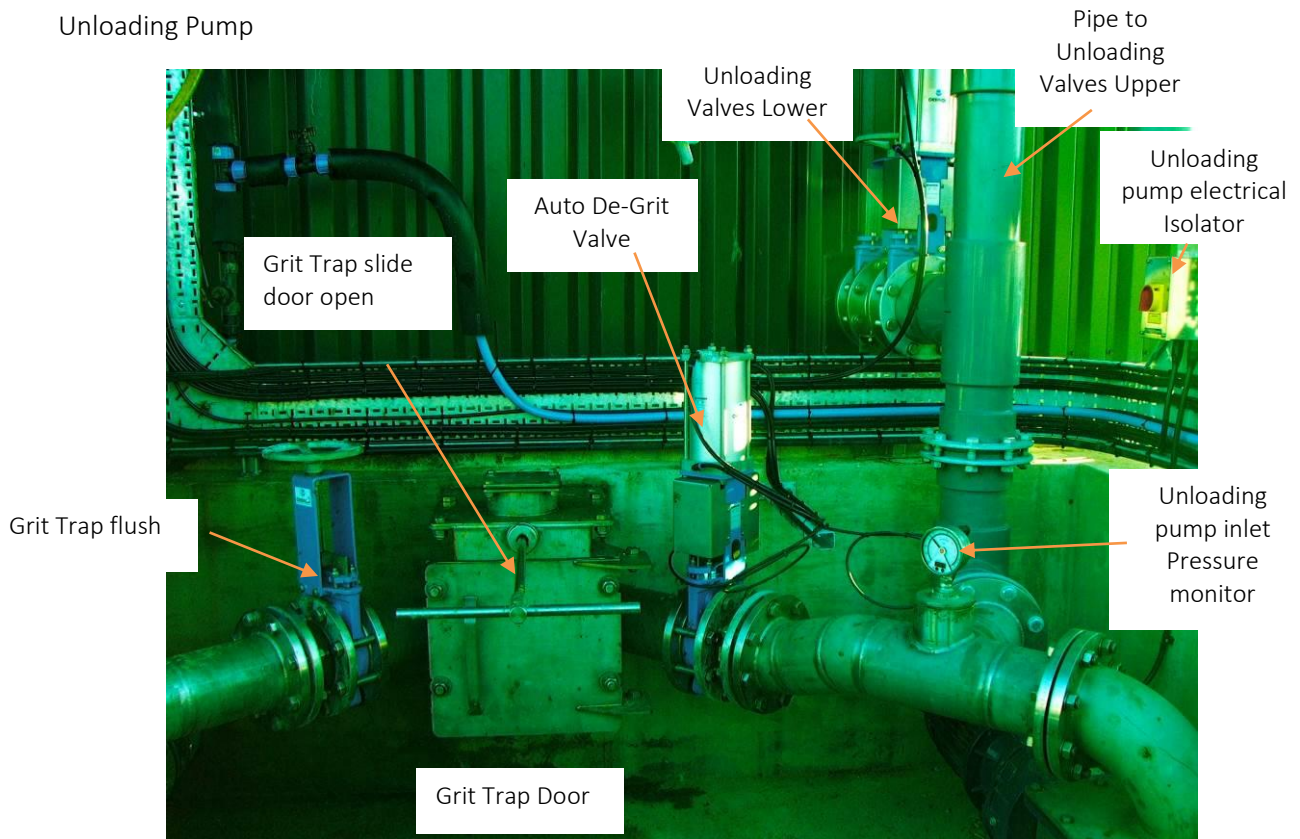
- Pump pressure monitor
- Digester Loading Valve
- Loading Pump Flow Meter



- Solids Loading Point
- Tank side loading

- Underfloor Loading
- Grit Trap Flush

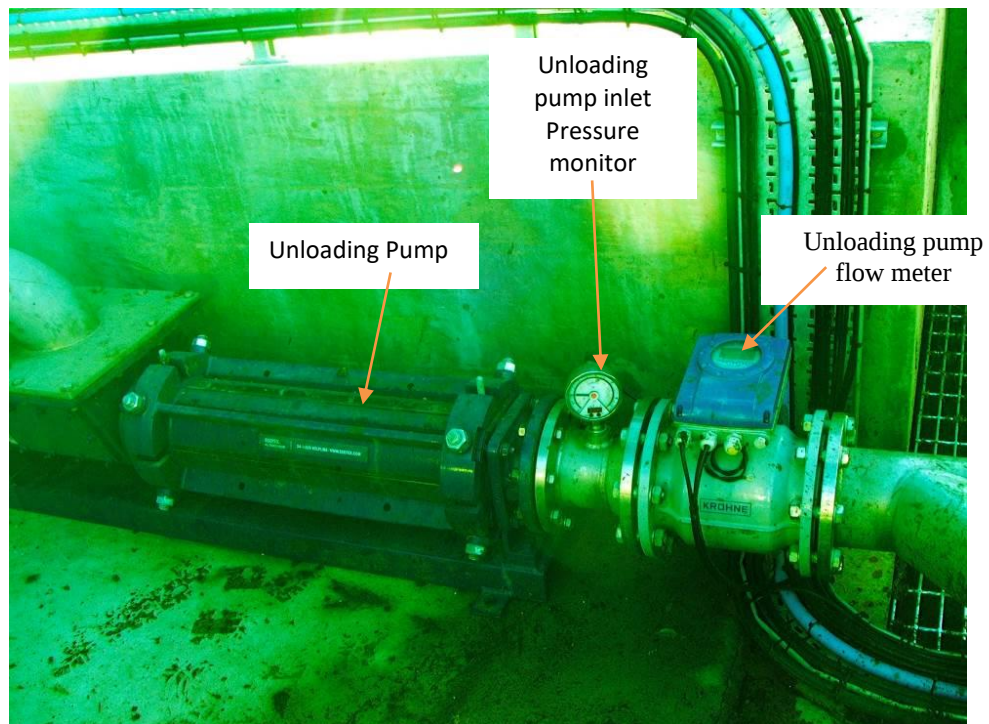
Unloading Pump

**NOTE!**

DO NOT OPEN THE GRIT TAP DOOR IF THE SLIDE DOOR IS NOT FULLY CLOSED

Do not attempt to open the grit trap without training from FRE-Energy

Unloading Pump



Valve to Grit Trap Sump

5.2 Unloading pipe connections to Digester

Digester Upper Unloading Valves



Digester Lower Unloading valves

5.3 Above ground Digester

Foam Alleviation, Overflow and Over pressure protection



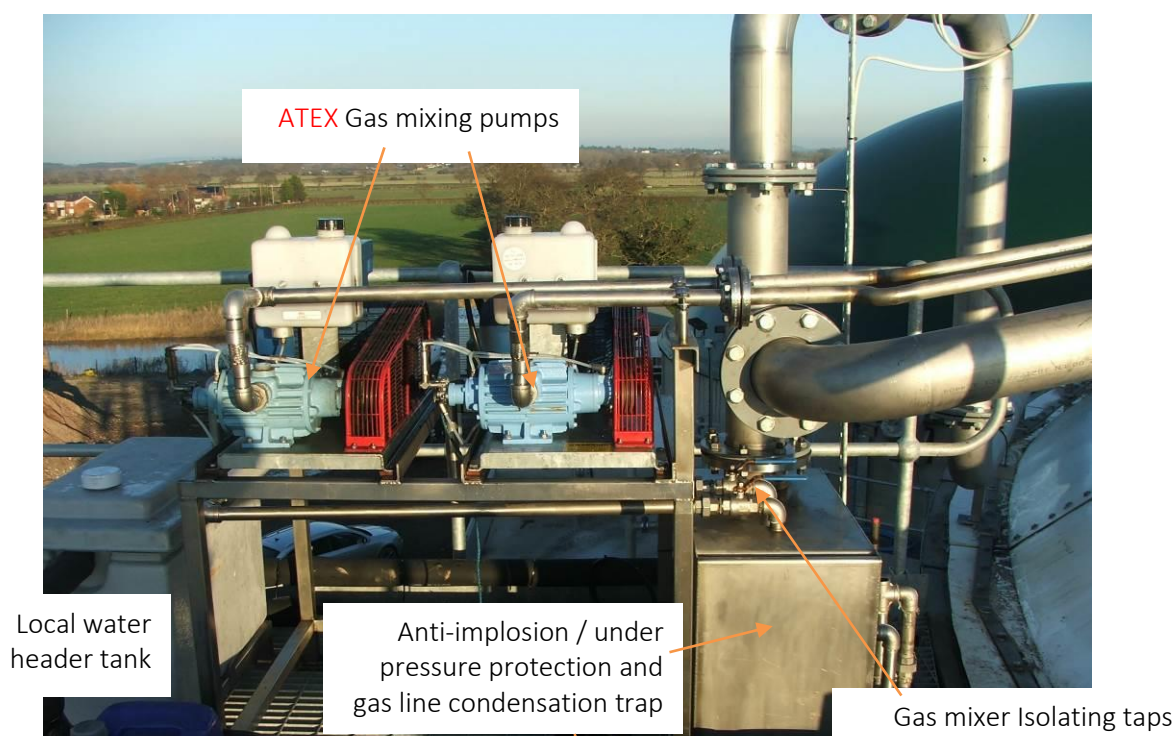
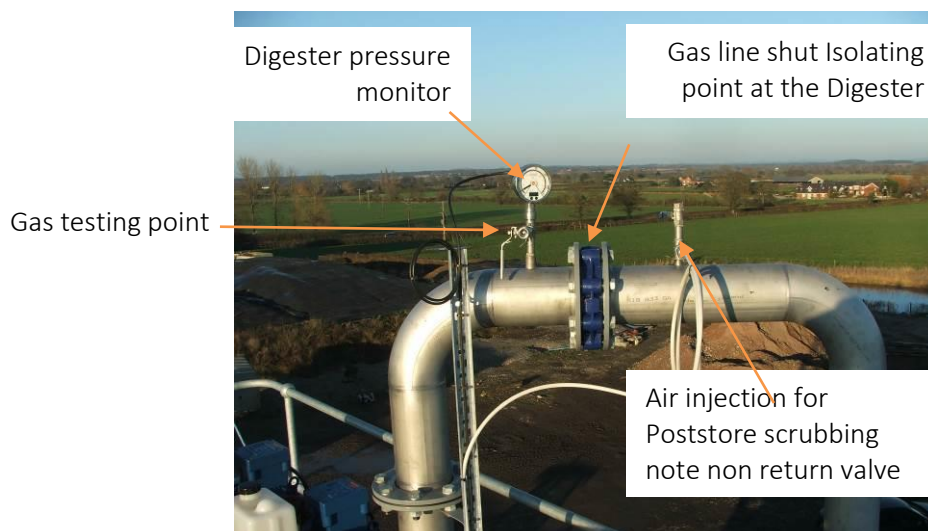
Notes

This is the overpressure protection for the digester Tank, it is the secondary for the system (the overpressure at the Poststore will trigger first this should only activate if the valves in the gas line between the two tanks are closed, there is a blockage in the line or there is an overflow or foaming incident in the digester).

This is classified as ATEX. There is a potential for gas to exit the system here.

Any items located within 3m of this device must be ATEX rated. This area is to be kept freely ventilated.

The system is protected by an ATEX rated immersion type heater. However, in extreme sustained cold weather it would be advisable to top up the reservoir with anti-freeze.



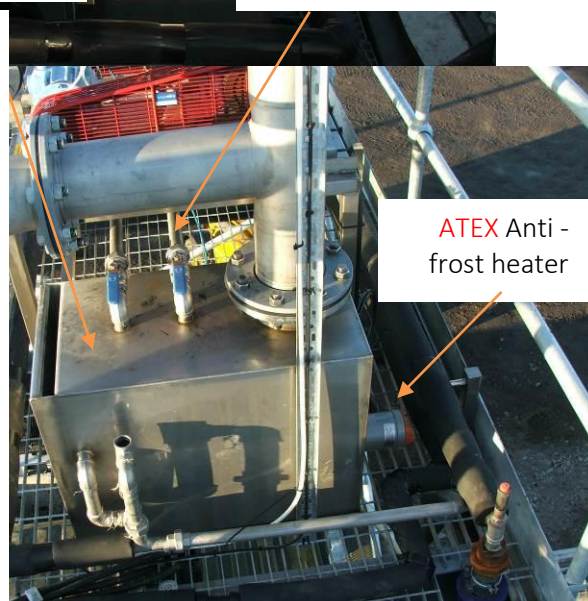
Note!

This area is defined as ATEX, there is a minimal risk of a gas leak. This area is to be kept freely ventilated.

The Condensation trap is the under protection for the Digester tank, under normal operation the unit on the Poststore will activate first – However, if the digester tank is Isolated this will protect the digester tank.

The condensation trap is protected from frost by the ATEX immersion heater. However, if there is sustained very cold weather it would be advisable to top this up with Anti-Freeze.

Gas mixing pumps are Isolated at the Mixing System control panel in the control room.

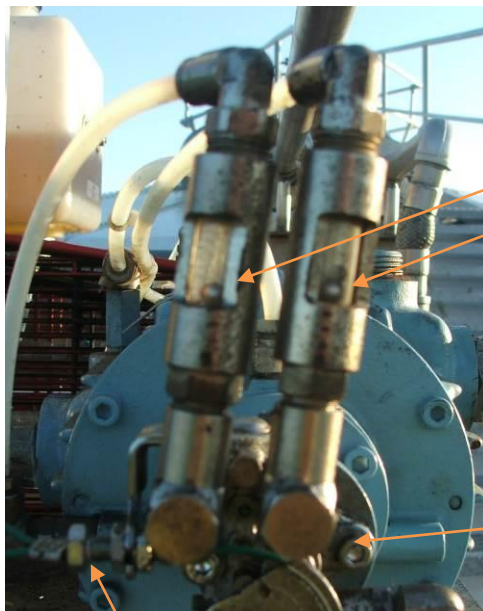


Gas mixing pumps: Gas mixing pumps are Isolated at the Mixing System control panel in the control room.

Lubricating reservoirs it is important that these are kept topped up. Running the pumps with no lubrication causes irreparable damage.



Lubrication Flow indicators

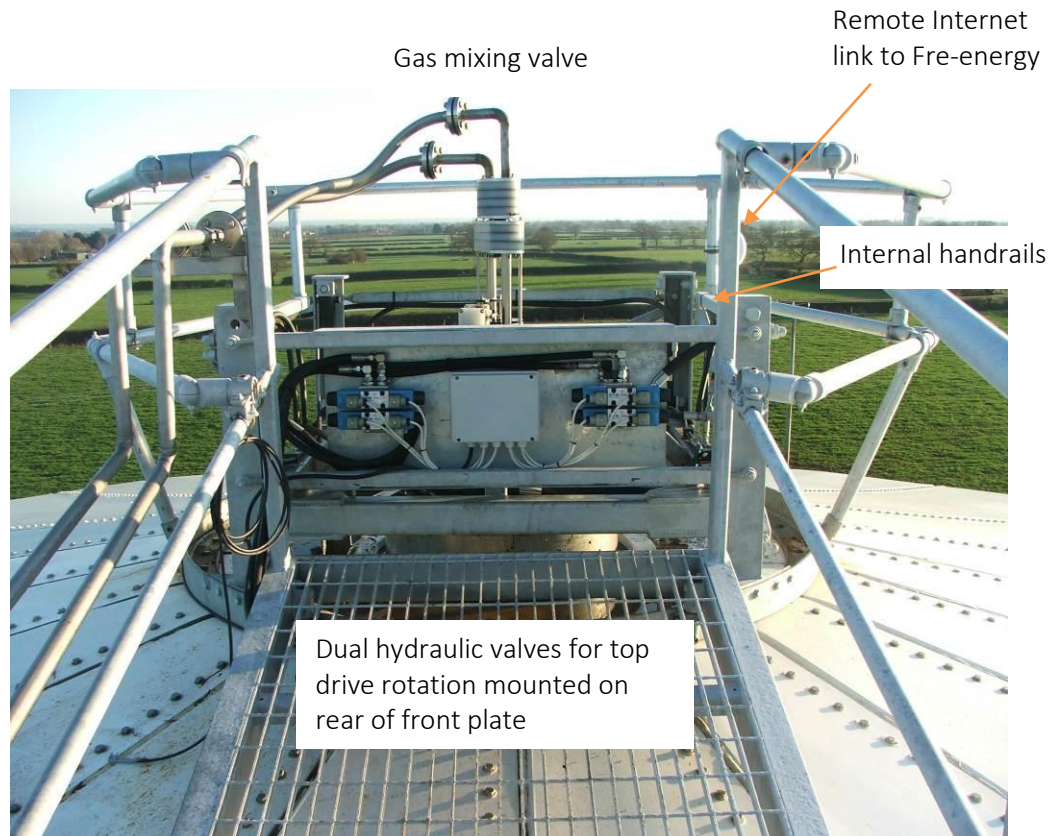


Lubrication Flow indicators
Check these Balls are lifting
in both sight glasses when
the pump is running

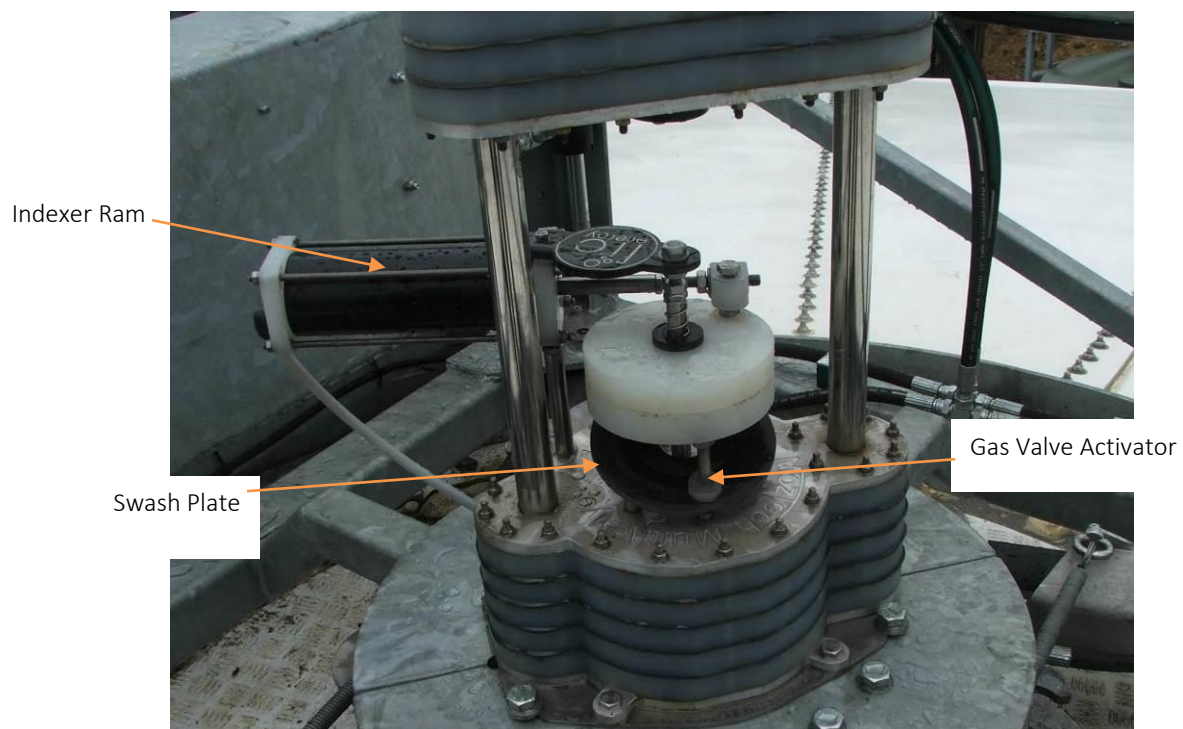
Lubrication pump driven
from main shaft

Pump flow adjustment – ensure the
balls always lift into the window area.

Top Drive and Gas Mixing Valve

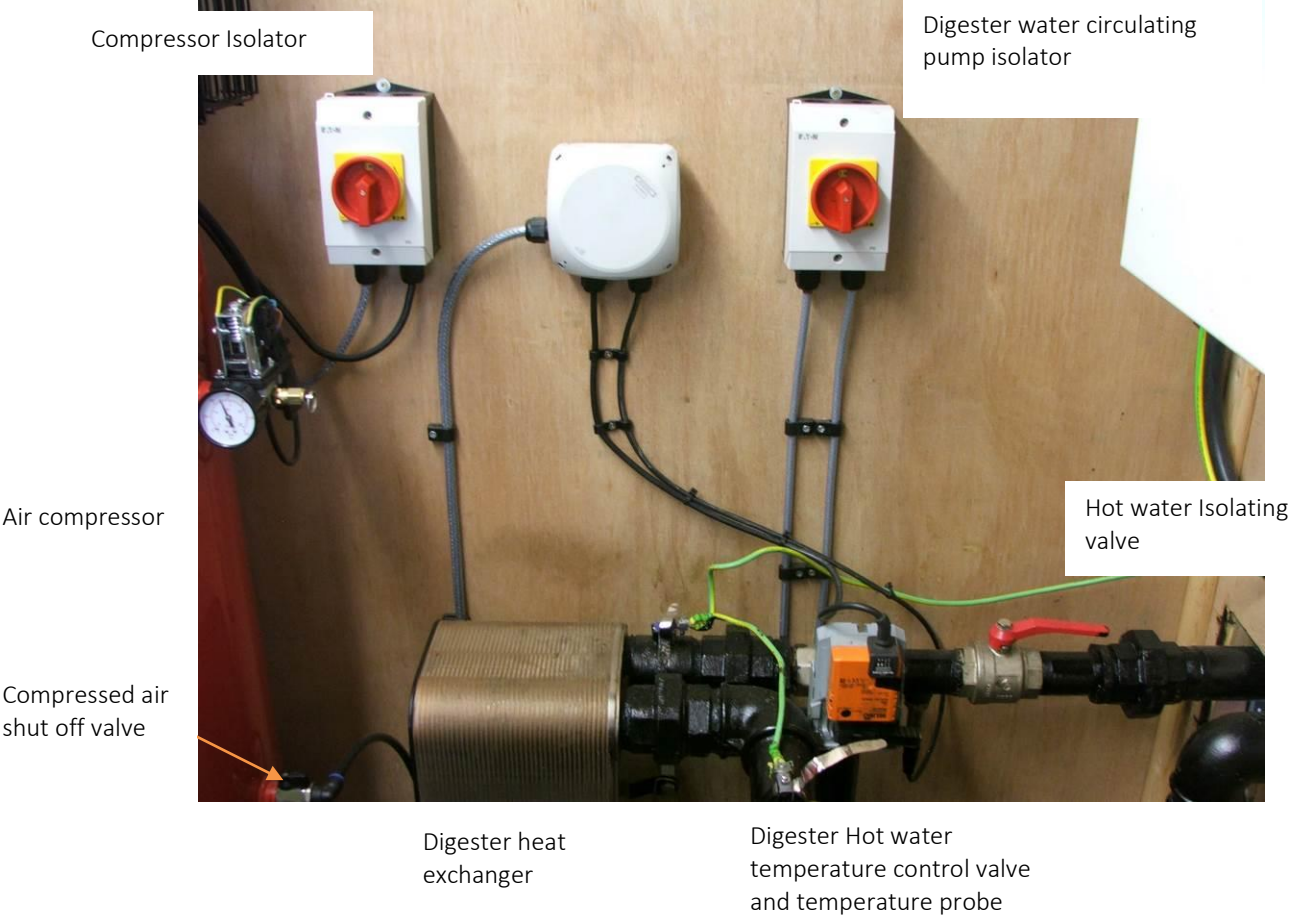


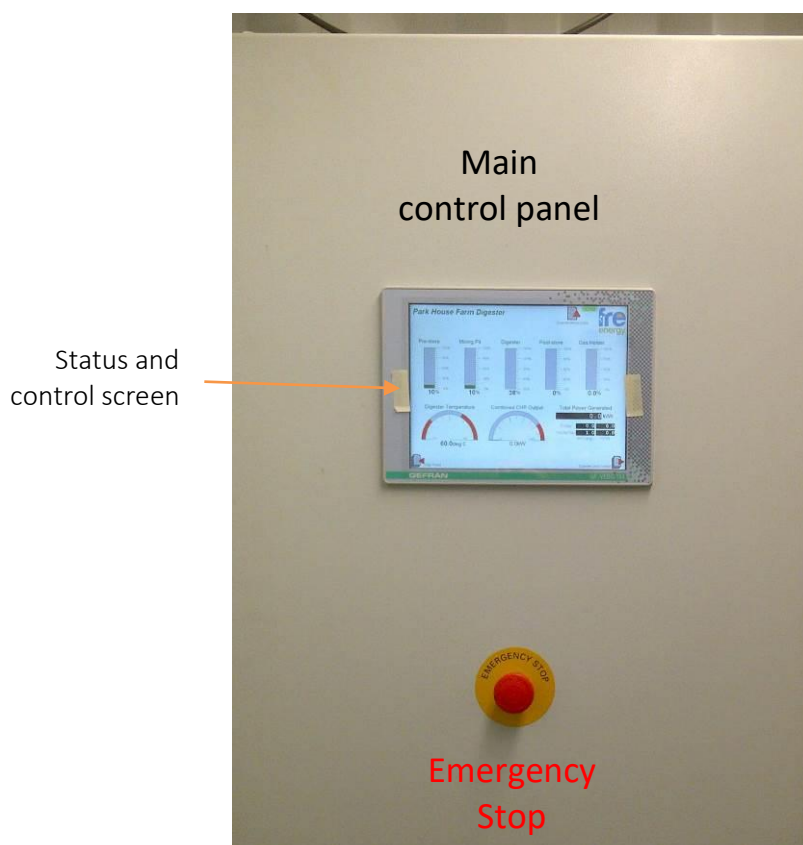
Note! There is a possibility of a minor gas leak in this location. The valves are mounted behind the plate to improve clearance. Do not enclose this area, keep freely ventilated. Do not install any non-ATEX electrical equipment within the area enclosed by the front plate and the internal handrails



Hydraulic systems are isolated at the Mixing control panel located in the main control room

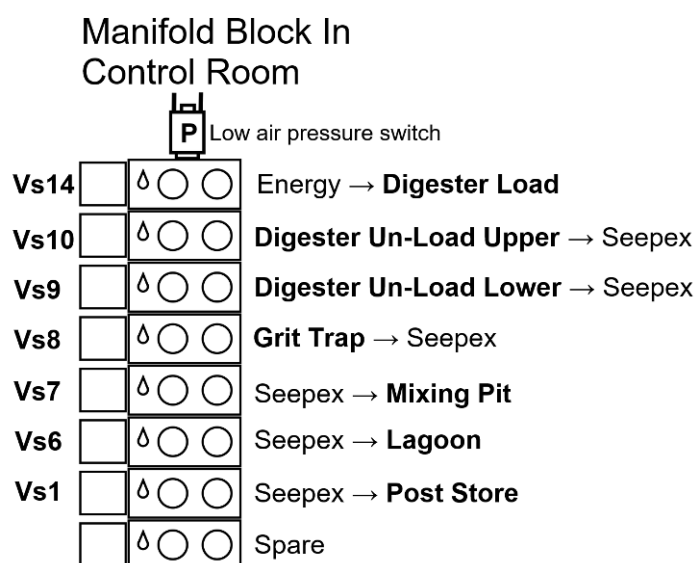
5.4 Control Room



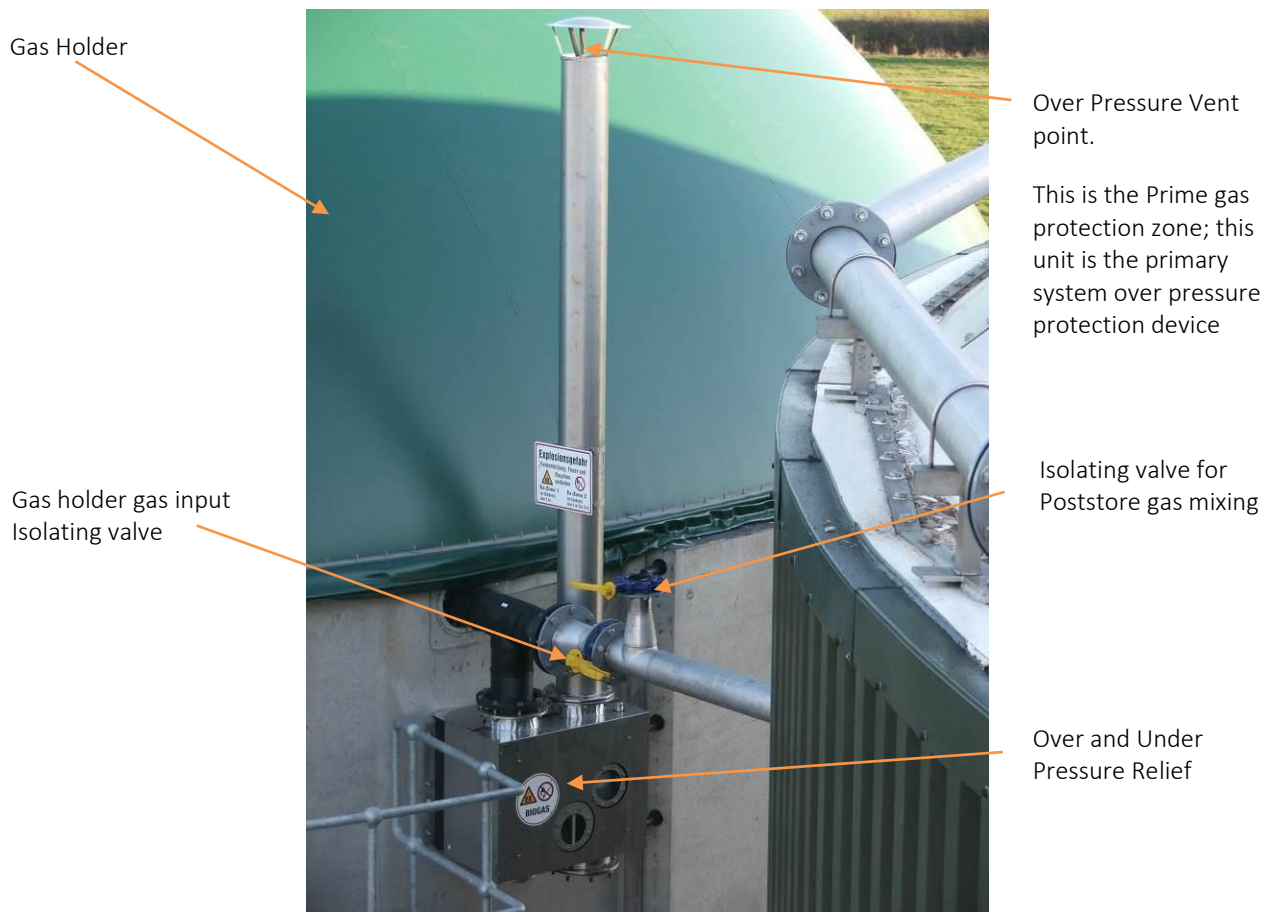


Air distribution manifold

The local air distribution manifold is located on the back wall to the left of the compressor. This controls the air signals to drive the valves in and around the Pump Sump. The Remote (Upper and Lower on the Post Store) Air actuated valves are driven locally.



5.5 Post Store and Gas Holder



This protection device is to protect the Poststore from under and over pressure , it also acts as the system protection device , There is secondary protection at the digester but this is sized for digester which operate at higher pressures.

ATEX ZONE: The area around the Pressure protection device is one where there is a high likely hood of gas emissions . Any electrical items installed within 3 meters of the exhaust stack and the pressure protection vesel must be ATEX rated. Care must be taken to ensure this area is not enclosed and to maintain free ventilation.

Maintenance and operational information for the over- and under-pressure protection can be referenced in the documentation provided by the equipment provider.

Note! This equipment was not supplied or installed by Fre-energy.

5.6 Gas holder and visual gas quantity measure

