CTS Fuel Conditioning Unit

Complete with 2 micron & 10 micron filtration for particle and water removal, and a magnetic fuel conditioner and control electronics.

WARNINGS 

- Unit is not designed for pumping any fluid other than EN standard diesel fuel or HVO/GTL fuel.
- Do not site the unit adjacent to a petrol dispenser or hazardous zone.
- The installation of the unit including the electrical connections must conform to all relevant electrical and local authority regulations and standards.
- The unit should be installed in a well ventilated area, and all cabinets should be ventilated, and the tank designed to accept a fuel conditioning system.
- If the unit is fitted to an above ground tank, please make sure that there is a check valve fitted with the correct spring ratio and pressure relief to suit the tank height. Max suction pressure = -0.3bar, Max delivery pressure = +2.1bar. If in doubt install pressure gauges as per the pump installation manual.
- Unit installation must be performed by a competent fuel installation engineer.
- Make sure there are no warning messages on the front panel or fuel leaks after commissioning.
- Ensure that all relevant staff are trained on the operation of the unit, as part of your fuel installation risk assessment.
- The unit has been pressure tested and function tested after assembly and we recommend the use of union fittings to ensure that the sealed joints are not damaged by installation pipework.
- Fluctuating electrical parameters and fuel additives will reduce the life of the pump. Do not configure the system for cycles greater than 30mins.

SPECIFICATION

- Fuel Conditioning unit to improve stored fuel quality for up to 40,000 litre tanks
- Multi Pass ISO cleanliness target of 14/13/11 and <60ppm water (lab tested)
- High quality PIUSI pumping and metering products.
- Cim-Tek Ultimate Defense® 10micron and 2micron Hydroglass® media spin on canisters.
- For the conditioning of 1.5x storage tank capacity per month—running between 9am and 5pm, Monday to Friday (un-degraded filters)
- IP55 protected electronics & pump, installed on a rear back plate for easy mounting to a tank.
- Magnetic fuel conditioner for breaking down bacteria molecules and double stage water and particle filtration.
- Custom micro controller with touch screen indicating operational messages.
- Customisable tank size, run time and degraded set points.
- Pulse meter controlled filter degradation and trending visualisation.
- The internal timer that controls the pre-set time periods that the fuel is circulated, is determined by a pre-set tank volume.
- Mushroom style stop button on the plate to allow the immediate stop of pump functions by anyone.
- In the event of the filters blocking, the screen will display the corresponding message and the pump will switch off until the filter is replaced.
- Leak sensor input—for connecting to the drip tray fitted below the pumping unit.
- Low Fuel Level input for connection to a relay output on a tank gauge or tank alarm system.

- Non Latching Input for Low Level / Leak (N/O); for connecting a tank alarm or electronic gauge to detect a low fuel level. Activates the warning on the control panel and turns off the pump, Leak sensor is included and must be installed in a drip tray below the unit.
- Two passive BMS outputs for remote warning of filter block and low level/leak to alert the user that they need to take action. Low Level and Leak are a shared output.

Models Available:

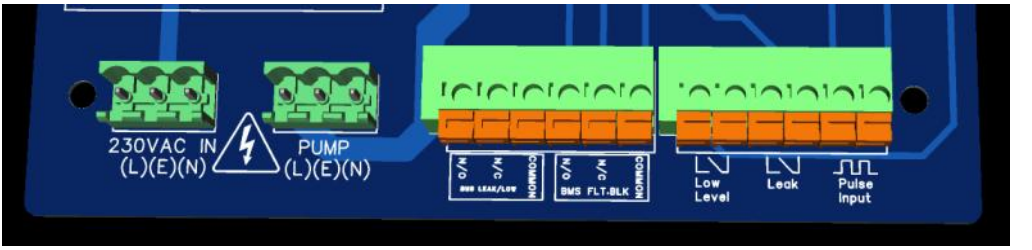
CTS1080—For circulating (50lpm) max. 3000 litres per day (40,000l tank)

ELECTRICAL CONNECTIONS

Your unit will be already pre-wired with a 2000mm fly-lead. Replace or use conduit if this is not suitable for your installation assessment.

Please wire this through a suitable RCD protected, local double pole switch disconnect-or fed from a 6A motor rated breaker ©, with a stable 230v 50Hz supply.
(+/-5% tolerance on voltage)

INPUTS & OUTPUTS



We recommend terminating the pump wires in a ferrule before connecting to the terminal blocks to ensure a positive reliable connection. Check that the polarity is correct once the terminals are installed.

Use a flat blade screwdriver to open the constant tension contacts, pre-twisting the exposed core and push fully to insert. Use 0.2mm² to 1.5mm² cables

INSTALLATION

- Ensure all pipework that is to be connected is free of any weld debris / excessive sealant, minimum dimensions of 1" pipework with a max tank height of 2.8m. Suction pipe to be as short as possible and delivery pipe to return to opposite side of tank to gain a cyclic effect.
  Non Return Valve must be installed on suction line inc wire strainer.

  Max suction pressure = -0.3bar, Max delivery pressure = +2.1bar.

  If in doubt install pressure gauges as per the pump installation manual.

- Mount the rear plate to the tank or wall with sufficient fixings.
  (See fig 1—Page 21)

- Connections to the inlet and outlet can be via flexible couplings and union fittings. Flexible coupling must be inspected regularly and changed when required.

- We supply a ball valve for the suction inlet and delivery outlet. These are to be fitted by the installer / fabricator at a point deemed appropriate to the installation to allow simple filter changes.

- If fitted outdoors ensure a rain & sun deflector is installed above the unit.

- Remove the bottom panel to revel the input terminals— refer to manual and circuit board for connections.

- Ensure the connection pipework in not stressed when connected.

- Use all the plate fixings points where available.

- Ensure the unit can be serviced easily once fitted

IMPORTANT!

Please note: You must use the leak probe. Create a containment system or drip tray under the unit to aid in filter changing and detection of leaks. If the unit leaks then the system will shut off to prevent the tank emptying. If outdoors—ensure rain/sun shield covers and prevents rain in drip tray.

QUICK START

Hydraulic and Electrical connections must be in place

Enter Engineer Mode

⇩

Set the Tank Data

⇩

Set the pump run time and flow delay

⇩

Check Low Level input

⇩

Check Leak Sensor operation

⇩

Check the pipework for stress

⇩

Check inlet and outlet valves are open

⇩

Turn on Manual Mode

⇩

Press the Start button and prime the unit

⇩

Press Stop button once primed

⇩

Check unit and pipework for leaks

⇩

Exit engineer mode

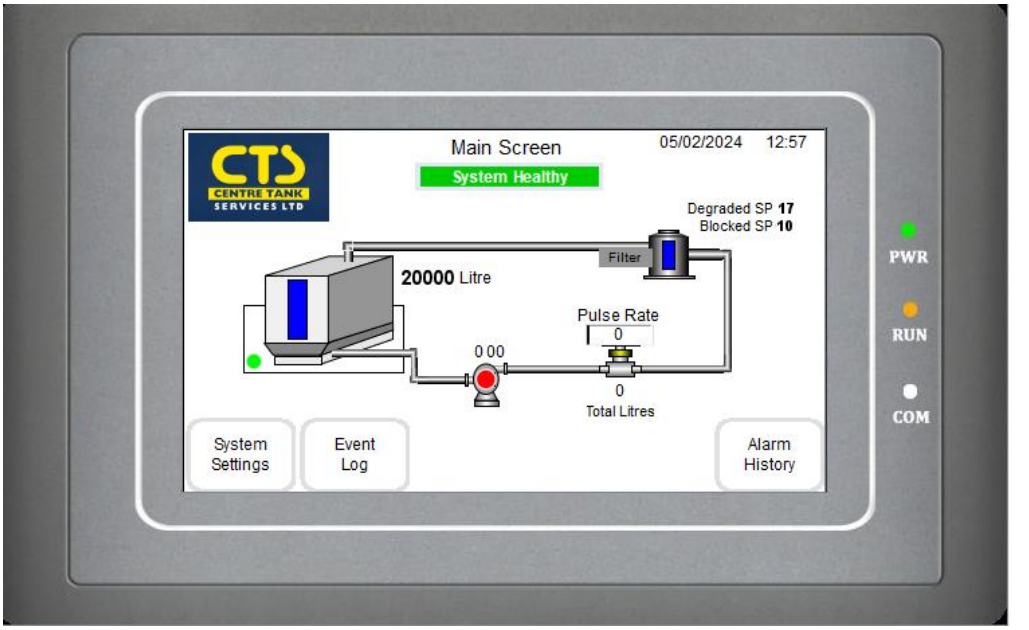
⇩

Advance the schedule to after current time

⇩

Check that unit activates on schedule

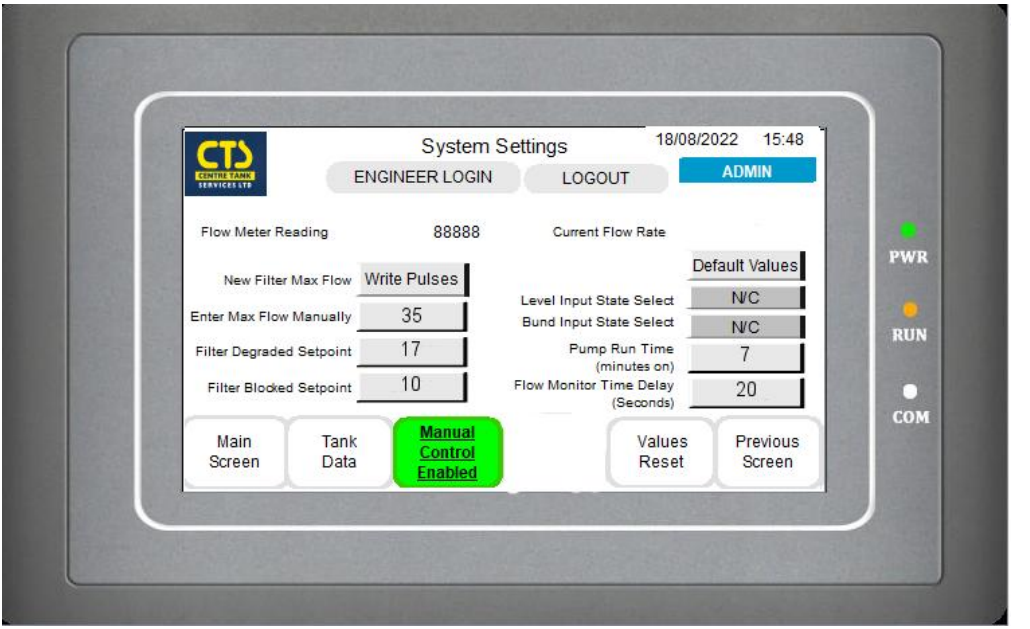
INITIAL CONFIGURATION



The default screen will display the factory pre-set information.

PRESS "System Settings" Button, then PRESS "Engineer Login Menu"

ENTER PIN Number **** (Supplier of Equipment will have this)



The set-point information has been pre-configured to suit the Panther 56 pump that is installed on the unit and to ensure the pump does not run outside of its working pressure curve.

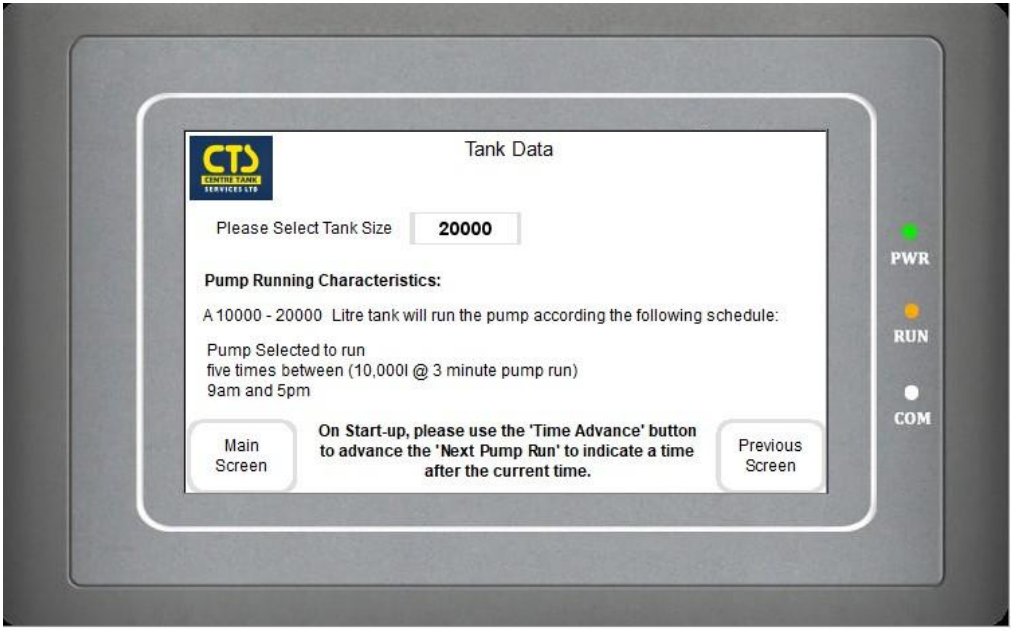
The pump run time can be configured by the engineer based upon the TANK DATA screen recommendations or adjusted to give a custom run parameter.

The flow delay is configured here to allow for larger installations that could potentially loose prime—acts life a self priming timer to ignore the flow until its stabilised after starting a cycle.

The Input logic is fixed at Normally Open

The Output logic is Normally Open but an engineer can change the connections on the relay board to give Normally Closed output—depending on BMS input requirements.

PRESS "Tank Data" Button



PRESS "Tank Size" Field
Enter the tank size required

Information and suggested run times will be given and preconfigured for a range of tank sizes to ensure 1.5 x the tank size is being conditioned every month based on Mon—Fri 9am to 5pm.

Example :- 20,000l tank size selected = 50 lpm x 7mins run = 350 litres per run

350 x 5 runs in one day then multiply by 21 days = 36,750 per month

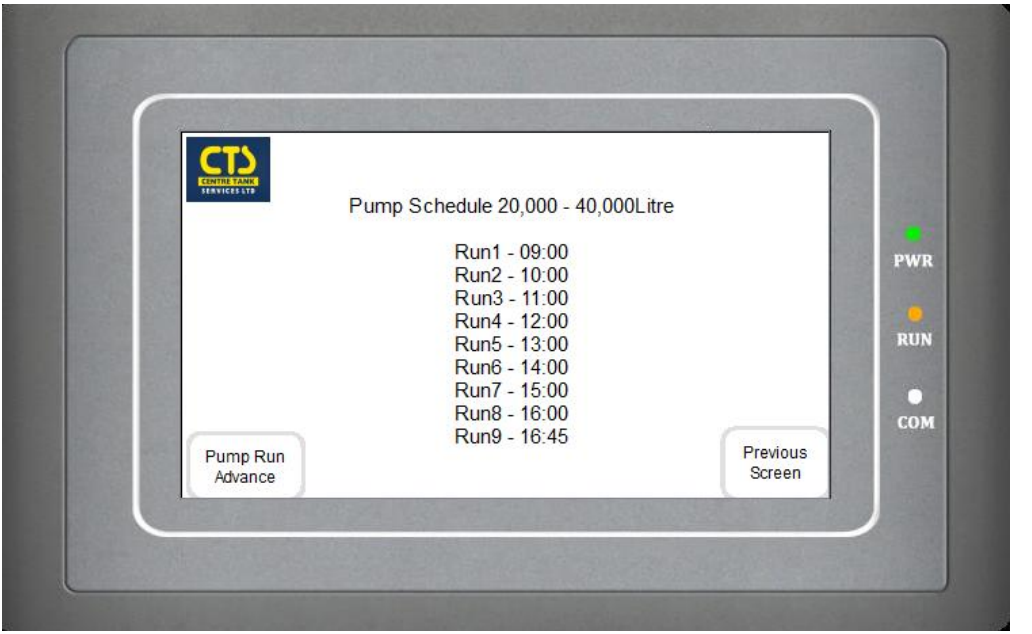
Note—If you want to run a SUPER CLEAN on a smaller tank then set the tank size to 40,000l and set the pump run time to 10 mins. You will now condition approx 4,500l per day or 94,500l per month—but be aware you will reach the pump service life quicker,….and require a pump change earlier than expected.

PRESS "Logout" on System Settings screen

RUN SCHEDULE INFORMATION

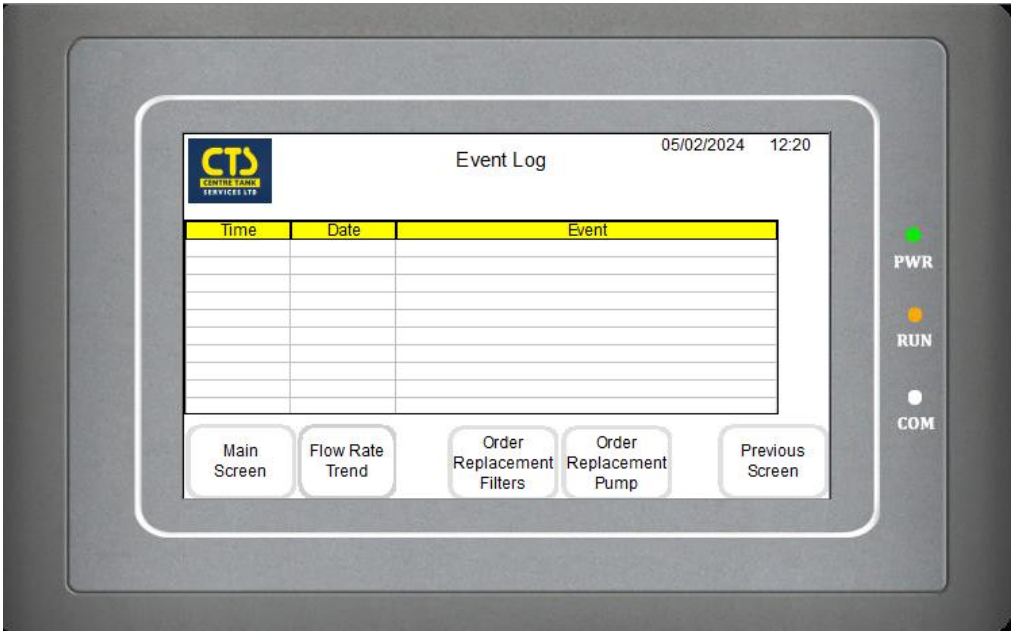
PRESS "View Schedule" Button on Main Screen

The schedule displayed is based upon the tank data selected.



EVENT LOGGING & TRENDING

PRESS "Event Log" Button on Main Screen



The Event Log displays a history of the working of the fuel conditioner and can be checked by on-site maintenance personnel to ensure correct operation of the unit or to troubleshoot.

The following are time stamped with HH:MM:SS

Pump Started

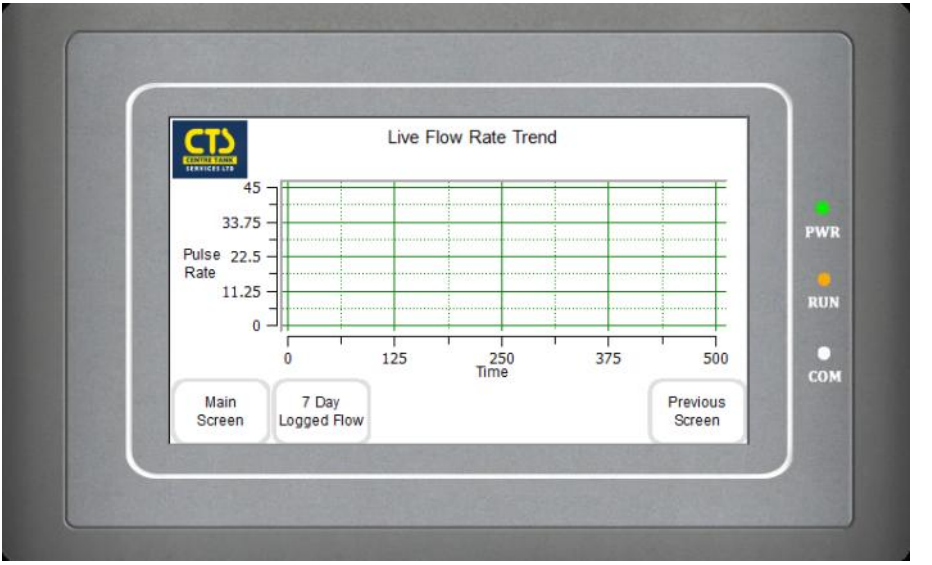
Pump Stopped

Engineer Logged In

Engineer Logged Out

Low Fuel Level

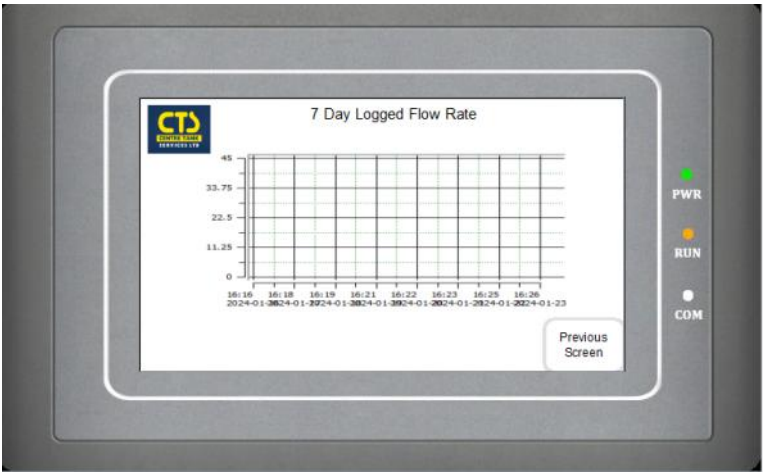
PRESS "Flow Rate Trend" Button on Main Screen



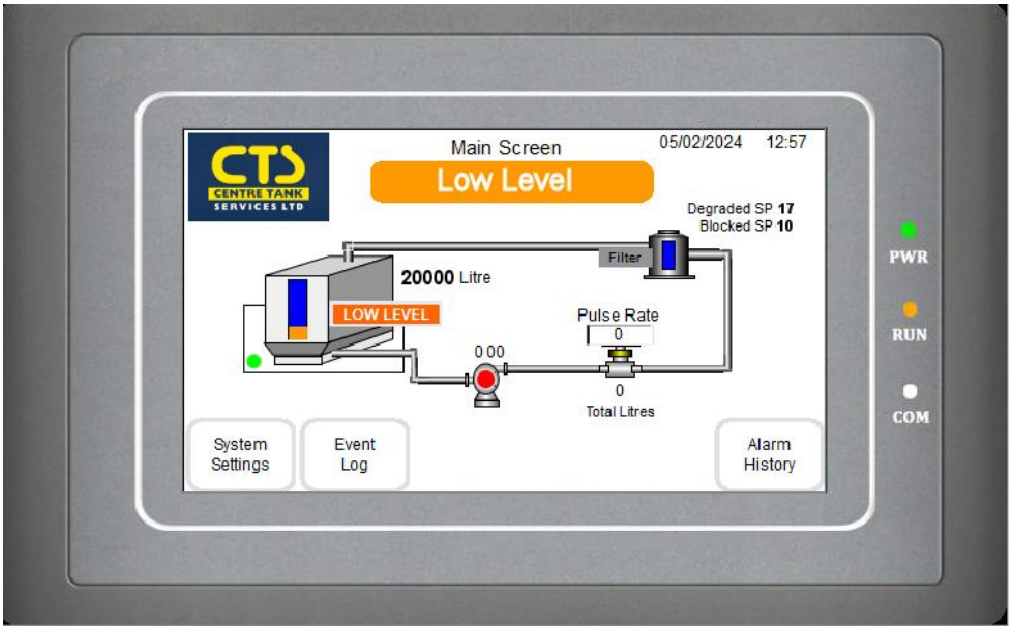
The flow rate trend can be viewed on this screen during pump running only and any reduction in flow can be visibly seen and the filters changed before any warnings are displayed, best viewed late in the day.

Longer flow trends can be displayed too—useful for historical checking.

PRESS "7 Day Logged Flow"

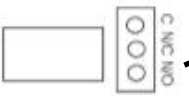


LOW FUEL LEVEL ALARM



The system is fitted with a Low Fuel Level input terminal. This feature will pause the operation of the pump until the storage tank fuel level returns to normal, therefore automatically recovering from this situation and <u>not</u> reporting a filter block error as there is no fuel passing through the unit.

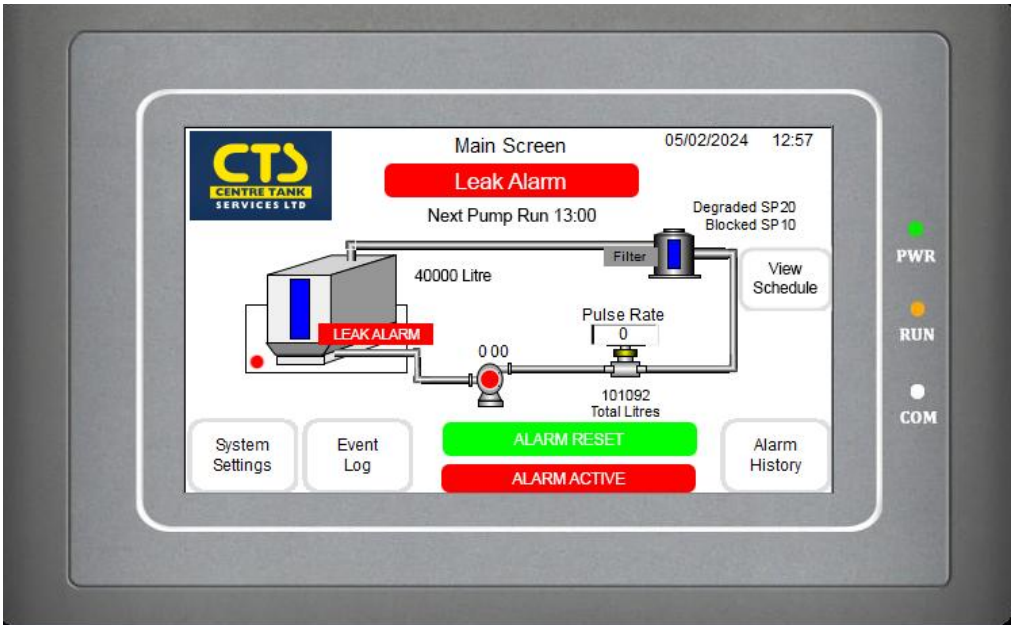
Connect a relay output on a tank alarm or tank gauge to the corresponding input terminals on the fuel conditioner.



Wire from the Common (C) and Normally Open (N/O) terminals on the alarm or gauge into the LOW terminals on the fuel conditioner.

The Low Fuel Level is reported in the alarms screen log
There is 1 x shared volt free contact for connection to a BMS or other external equipment that activates on <u>either/both</u> Low Level or Leak Alarm.

LEAK ALARM



If the leak alarm sensor activates then the unit will stop operation.

This is to prevent emptying of the tank if the unit or attached pipework develops a leak and will prevent the unit from continuing to operate.

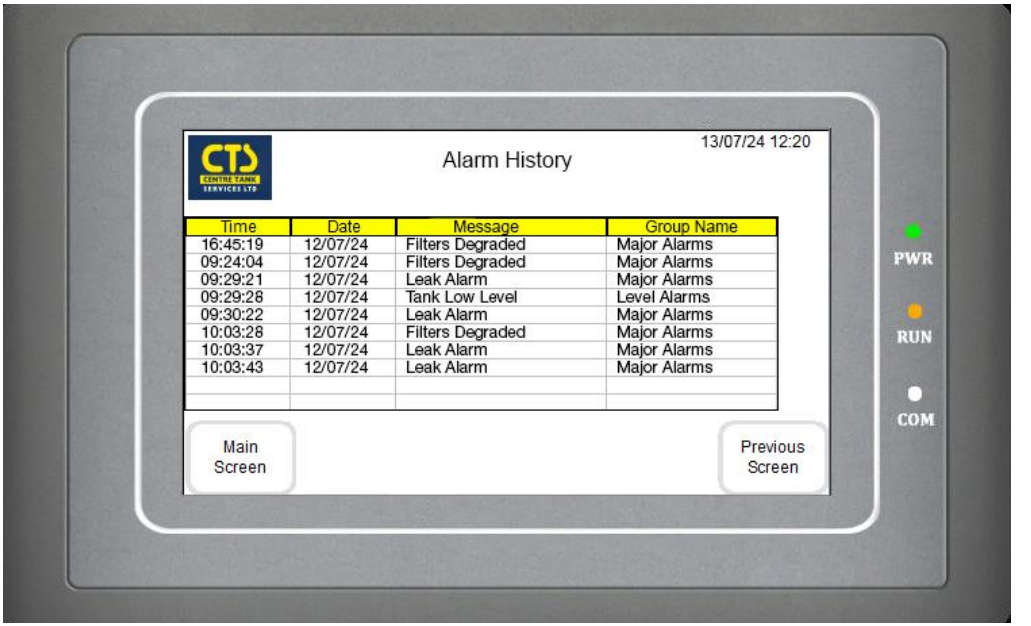
Manual user intervention is required to RESET the alarm after the leak has been solved, before the unit will resume automatic operation.

PRESS "Alarm Reset" button

The Leak Alarm is reported in the alarms screen log

There is 1 x shared volt free contact for connection to a BMS or other external equipment that activates on either/both Low Level or Leak Alarm.

ALARM LOGGING



Alarms are registered in the alarm logging section.

This section details important historical alarm information that can be viewed from the home screen by anyone.

Alarms Reported will be in the full time format HH:MM:SS :-

Filters Degraded

Filters Blocked

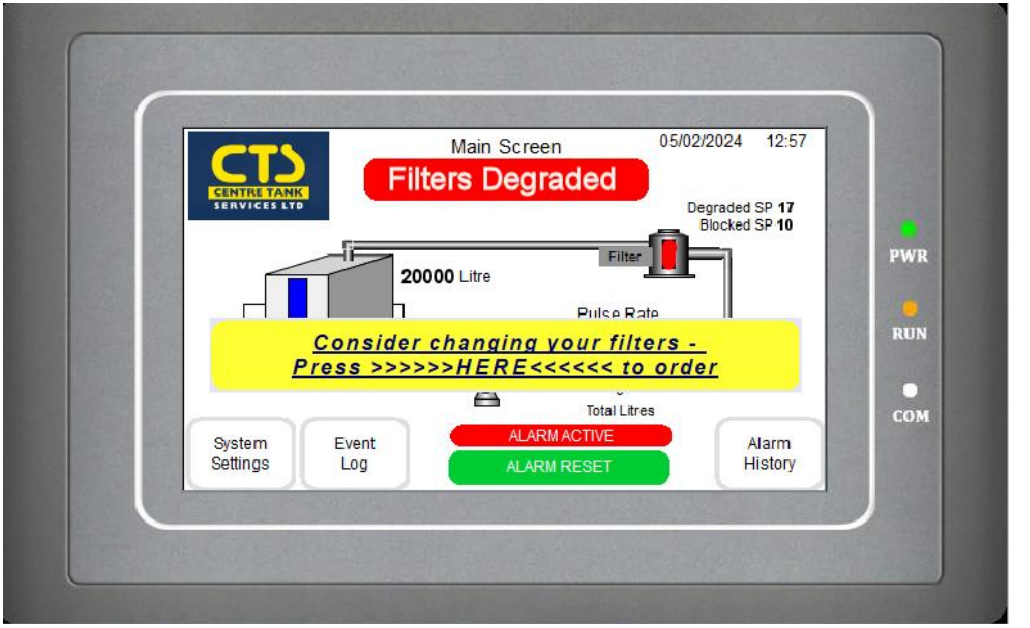
Leak Alarm

Low Fuel Level

No Max Flow Set

No Flow Delay Set

DEGRADED FILTERS



When the filters start to reach the end of their useful life the unit will provide a visual alert on the screen during the current running cycle.

The operator has the option to RESET this alarm during the running cycle and see if it re-appears.

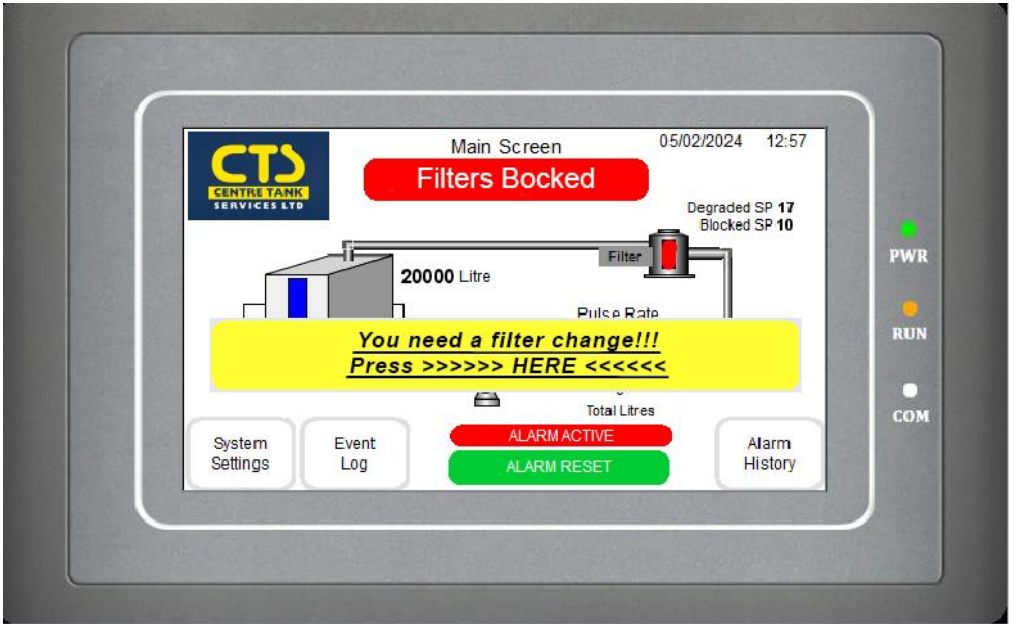
The Degraded Filter Alert is logged to the Alarm History Log

This feature allows the customer to re-order new filters by CLICKING on the alert box, the unit will continue to run allowing the new filters to be delivered.

IMPORTANT!

Any servicing engineer will also have the degraded filter information in the Alarm History and can choose to change them pre-emptively instead of having to re-visit as the filter life is unknown on other systems.

BLOCKED FILTERS



The end user has the option to re-order the new filter canisters from either the QR code or by calling the manufacturer.

CTH1851 - Cim-Tek Hydroglass® Bio Water Filter Element 2 Micron 70037

R14862 - Cim-Tek Hydroglass® Bio Water Filter Element 10 micron 70024

The pump will **STOP** on the Filter Block Alarm and not start again until the filters have been changed and the **ALARM RESET**.

There is 1 x volt free contact for connection to a BMS or other external equipment that activates on the Filter Block Alarm.

RE-ORDER FILTERS

The end user has the option to re-order the new filter canisters from either the QR code or by calling the advertised contact.

CTH1851 - Cim-Tek Hydroglass® Bio Water Filter Element 2 Micron 70037

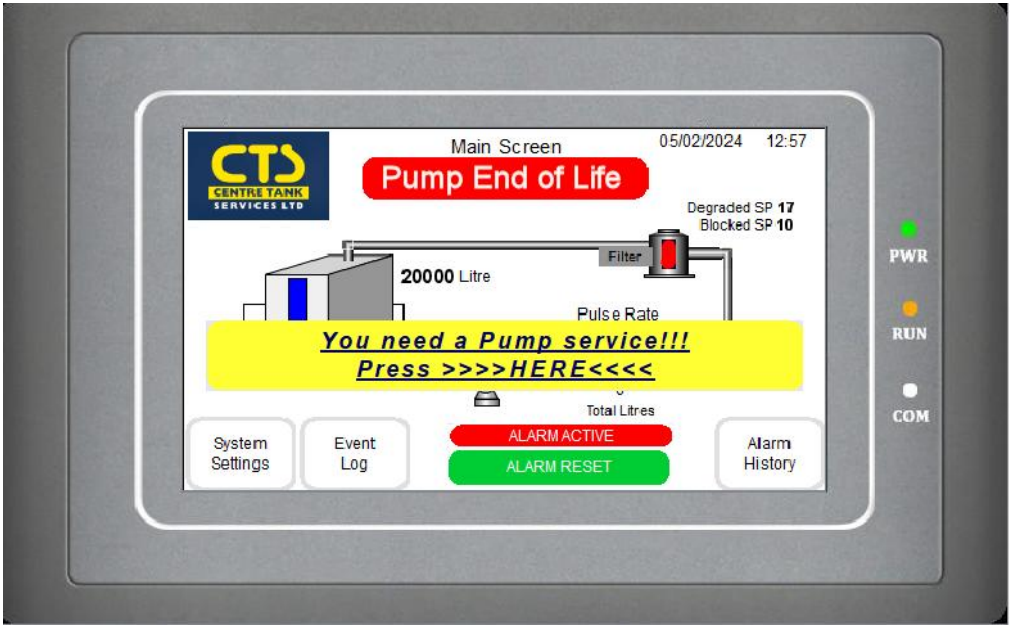
R14862 - Cim-Tek Hydroglass® Bio Water Filter Element 10 micron 70024

CHANGING BLOCKED OR DEGRADED FILTER

The unit is fitted with a pulse meter that detects when either of the canister filters are blocked. Upon detection, the PLC will stop the unit, and trigger a passive output to a BMS (if set up). The pump will not reactivate until the blocked filter has been replaced and / or the active alarm reset.

1. IMPORTANT: Press the STOP button on the plated unit to ensure the pump is isolated from power whilst maintenance is carried out.
2. Turn the lever ball valves off at the fuel inlet and outlet to prevent fuel loss.
3. Unscrew each canister using a filter strap and drain any excess fuel.
4. Inspect the filter head seat and wipe clean
5. Add the new rubber canister seal carefully and lubricate with some oil.
6. Refit each canister and tighten with a strap ensure that the filter gasket remains in the groove on the head.
7. Open the lever ball valve on the fuel inlet and outlet
8. Reset the isolator, Either wait for the next cycle, or enter the engineer menu and put the system in to manual mode to re-prime the canisters.
9. If no flow is detected the pump will switch off again, if this happens repeat step 8 and check valves are in the open position and check valve is not stuck.
10. Dispose of used filters as contaminated waste following onsite guidelines.

PUMP END OF LIFE

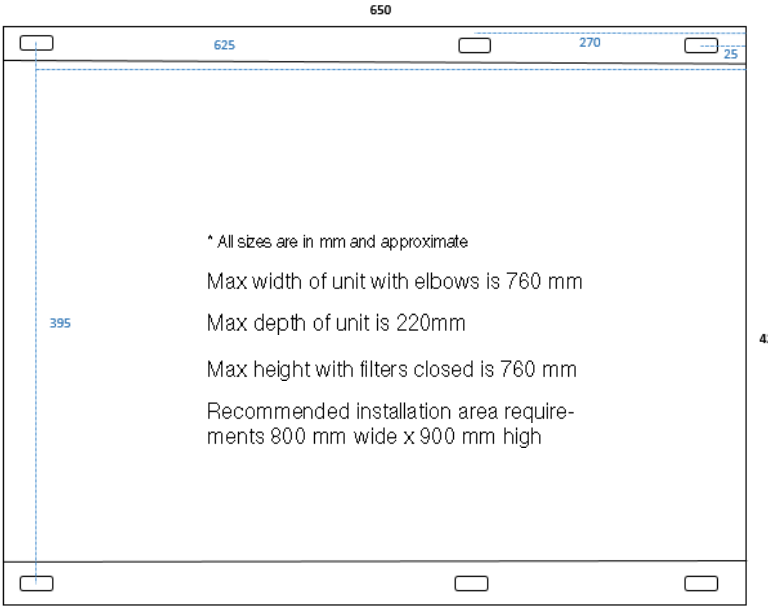


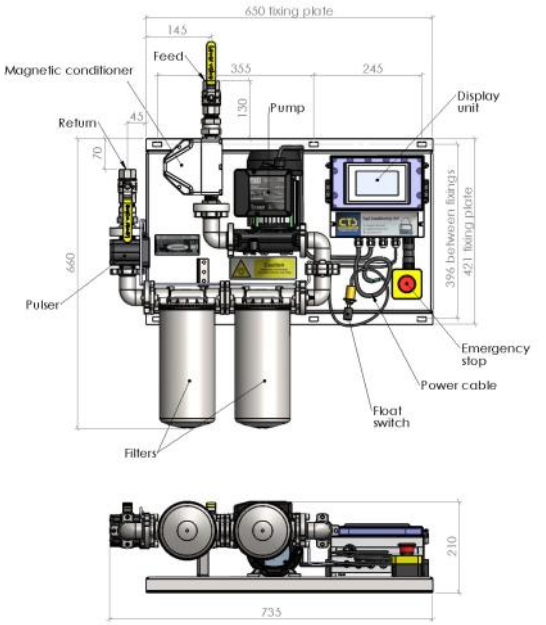
We suggest changing the pump after 1.5million litres processed through the system.

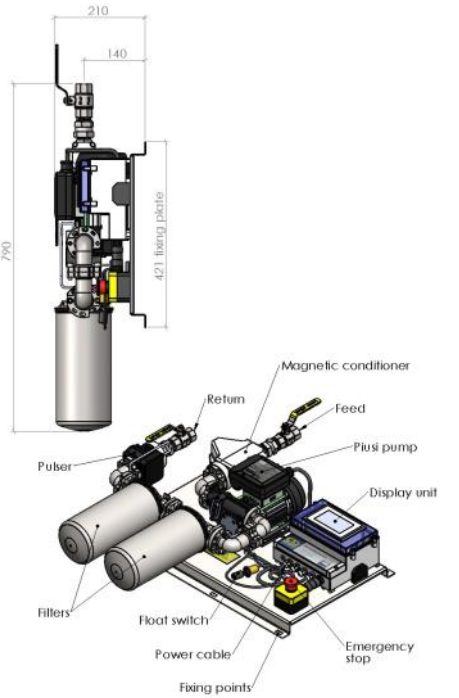
The above message will appear and write the alarm information to the log. Once cleared, the message will re-appear upon a power cycle.

A new pump can be ordered directly from QR code, or from the advertised contact.

DIMENSIONS


650
625
270
25
395
425
* All sizes are in mm and approximate
Max width of unit with elbows is 760 mm
Max depth of unit is 220mm
Max height with filters closed is 760 mm
Recommended installation area require-
ments 800 mm wide x 900 mm high


650 fixing plate
145
Feed
Magnetic conditioner
355
245
Display unit
Return
45
130
Pump
70
660
396 between fixings
421 fixing plate
Pulser
Emergency stop
Power cable
Float switch
Filters
210
735


210
140
790
421 fixing plate
Magnetic conditioner
Return
Feed
Pulser
Pisu pump
Display unit
Filters
Float switch
Power cable
Emergency stop
Fixing points

SERVICING

Please note, when servicing, you must cycle the power to the unit.

Periodic inspection and changing of the filter media as required. Large tanks should have filter media changed regularly.

Periodically check the leak sensor and low level inputs are working correctly.

On annual inspection the following should be changed:

- 2 x filter canister media & canister seals.
- Vanes and cover o-ring for pump.
- Clean pump inlet filter and any other suction strainers.
- Confirm pump is operating to declared electrical specification.
- Depending upon tank construction it may be necessary to check and clean the magnetic conditioner.
- Consider changing the pump and PSU when unit exceeds 1.5m litres.
- Consider changing the relay pack and PSU after 5 yrs.

SPARE PARTS

CTH1851—Cim-Tek Hydroglass Bio Water Filter Element 2 Micron 70037

R14862—Cim-Tek Hydroglass Bio Water Filter Element 10 micron 70024

R12066000—Canister Seal x1

R112760000—Vane kit for Panther pump. **R11461000**—Front o-ring.

SWS1035—Float **sensor** probe for drip tray/leak.

OPTIONS

F0075510D—230v Piusi OCIO gauge for tank reading and low level alert.

SWS2010—3 compartment mains alarm with probes for tank

All parts are RTB warranty and any replacements do not extend the overall warranty period.

Refer to our T&C's for further information.

TROUBLESHOOTING & FAQ

FILTER BLOCKED Alarm comes on whilst the pump is still programmed to run

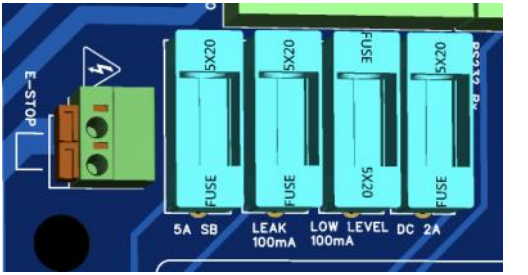
- Could be taking too long to prime once the pump starts – try changing the flow delay settings.
- Ensure the fuel pickup is far enough away from the fuel delivery (suction should be close to the pump and delivery should be to far side of the tank) as there is now air entering the system Try to shorten the time that the pump runs for.
- Check the filters… they are probably blocked.
- Check that the minimum pipe dimension of 1" I/D pipe is being used.
- Check the supply voltage is within tolerance—if not reduce the pump run time.
- Check the pump switch is in the ON position.
- Check for the RED Led inside the control box to activate the pump relay.
- Is there enough fuel in the tank ?

FILTER BLOCKED Alarm comes on after the system has only run a few cycles

- Likely that the filters are actually blocked! Check the alarm log to verify if the degraded filters were registered.
- If the fuel has never been filtered before the recirc unit is fitted then the filters will block quickly and are doing their job. Change filters and run unit again.
- Ideally the fuel should be polished before the recirc unit is used… or fresh fuel should be in the tank when the recirc unit is fitted.
- Check to see that the min pipe dimension of 1" I/D pipe is being used.

Pump Run Schedule is showing incorrect time to next pump run

Possible recent power interruption—cycle the power to the unit, then view the pump run schedule and advance the Schedule until AFTER the current time and ensure the unit automatically starts again.



Fuses— All fuses are 20mm glass fuses

F1 (PUMP) is 5A Slow-blow

F2 and F3 (INPUTS) are 100mA Normal

F4 (PSU) is a 2A Normal

Fuses are revealed by operating the main cover. Isolate all power before proceeding.

Time and/ or Date is shown incorrectly on the screen

Enter "Engineer" menu

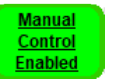
Click on the Time/Date (top right)

Adjust as required

Note: Cycle power after changing date/time

How to run the system manually to re-prime or check for any leaks

Enter the "Engineer" menu

Click "Manual Control" button (which turns green) 

Return to main screen

Now PRESS 

to run the pump and then press 

once finished

Remember to log out of the "Engineer "menu and Advance the Schedule.

Centre Tank Services Ltd
Model: Fuel Conditioner 2024 - CTS1080
Input: 230v AC 50Hz—4.5A

MADE IN UK