Certificate of Compliance

Certificate: 70024466 **Master Contract:** 179920 (084193_0_000)

Project: 70159224 **Date Issued:** 2018-01-24

Issued to: **The Haigh Engineering Company Limited**
Alton Road
Ross-On-Wye, Herefordshire HR9 5NG
UNITED KINGDOM

Attention: Stewart Thurlow

The products listed below are eligible to bear the CSA Mark shown with adjacent indicators 'C' and 'US' for Canada and US or with adjacent indicator 'US' for US only or without either indicator for Canada only.

C US

Issued by: Christian Sailer
Christian Sailer

PRODUCTS

CLASS - C389001 - MOTOR OPERATED EQUIPMENT - MISCELLANEOUS
CLASS - C389081 - MOTOR OPERATED EQUIPMENT - MISCELLANEOUS --Certified to US Standards

Model "Quattro Vanguard" and "Quattro Vanguard Enhanced" water-borne waste disposal machine, permanently connected, grounded, 120 V, 9.2 A

APPLICABLE REQUIREMENTS

CAN/CSA C22.2 No. 68-09		
incl. UPD1, UPD2 and UPD3	-	Motor-Operated Appliances (Household and Commercial)
UL 430 - 8th Ed.	-	Electric Waste Disposer (Household and Commercial)

Supplement to Certificate of Compliance

Certificate: 70024466 **Master Contract:** 179920 (084193_0_000)

The products listed, including the latest revision described below, are eligible to be marked in accordance with the referenced Certificate.

Product Certification History

Project	Date	Description
70159224	2018-01-24	Update to report 70024466 due to model revision and renaming – addition of name extension. Models Quattro Vanguard and Quattro Vanguard Enhanced acc. to standards CAN/CSA C22.2 No. 68-09 + UPD1, UPD2, UPD3 and UL 430 - 8th Ed.
70107671	2017-01-17	Update to report 70024466 due to standard update (UL 430-7th to UL 430-8th Ed.) and addition of alternative macerator motor and alternative version of optional "Foot Pedal Hands Free Lid Opening Kit" according to CAN/CSA C22.2 No. 68-09 + UPD1, UPD2, UPD3 and UL 430 - 8th Ed.
70024466	2015-09-11	Original certification of water-borne waste disposal machine model "Quattro", 120 V, 60 Hz, 9.5 A, permanently connected, grounded, according CAN/CSA C22.2 No. 68-09 and UL 430 - 7th Ed.

Contents

1. Introduction

This technical/maintenance manual is to be regarded by the owner/operator as an integral part of the equipment and must be available for use by the owner/service engineer as required.

It must be available during the life of the equipment and passed to any subsequent owner/user if the equipment is sold or transferred elsewhere.

Version number	DRAFT
Version date	January 2019
Author	Haigh Engineering Company Ltd
Manual number	902-029084

2. Safety precautions and procedures

This manual provides instructions which must be followed when installing, servicing and operating the machine.

Caution: "This machine is not a medical device and installation is limited to soiled utility/en-suite locations. Macerator only to be used and operated by hospital nursing or facilities staff."

WARNING – to reduce the risk of injury, users must read instruction manual

Please note:

- The machine should only be installed by suitably qualified technicians who have read this manual.
- A copy of the manual must always be at hand where the machine or installation is being used. Relevant sections of this manual may be printed from the manual on the CD that accompanies the machine.
- In addition to these general safety instructions you must observe the special safety instructions which are included in other sections of this manual.

Safety symbols

The hazard sign is used in the manual as a general hazard symbol to mark those safety instructions whose non-observance can result in danger to personnel or equipment

WARNING, RISK OF ELECTRIC SHOCK TO PERSONNEL

This sign is used as a warning against electric voltage:

- Single Phase supply - 120V

The safety sign is used to denote that appropriate Personal Protection Equipment (PPE) must be worn.

All instructions located directly on this machine must be observed and be kept completely legible at all times.

User Information acc. to FCC15.21

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Statement acc. RSS GEN Issue 5

This device contains licence-exempt transmitter(s)/receiver(s) that comply with Innovation, Science and Economic Development Canada's licence-exempt RSS(s). Operation is subject to the following two conditions:
(1) This device may not cause interference
(2) This device must accept any interference, including interference that may cause undesired operation of the device..

Cet appareil contient des émetteurs / récepteurs exemptés de licence conformes aux RSS (RSS) d'Innovation, Sciences et Développement économique Canada. Le fonctionnement est soumis aux deux conditions suivantes:(1) Cet appareil ne doit pas causer d'interférences(2) Cet appareil doit accepter toutes les interférences, y compris celles susceptibles de provoquer un fonctionnement indésirable de l'appareil..

Electrical safety

- Low voltage electrical equipment (less than 1000V) can cause serious or fatal injuries.
- Any person installing or maintaining this equipment should be fully competent to carry out this work.
- Such persons should be familiar with the relevant codes of practice or standards which are applicable to the country of installation.

Preliminary operating advice

- All instructions located directly on this machine must be observed and be kept completely legible at all times.
- This machine is designed to operate on a fully automatic cycle. During this cycle it will only stop if a fault occurs or if it is overloaded.
- If the hopper is overloaded beyond the recommended capacity the internal trip can cause the machine to stop. Continued abuse in this manner will eventually cause motor failure.
- If an emergency occurs, such as a foreign object being in the hopper, the machine should be stopped immediately by switching off the power at the isolator.

Staff qualifications and training

- All staff who operate, maintain, inspect or install the machine must be suitably trained and qualified and have the necessary equipment or tools to carry out their tasks safely.
- The person who is responsible for staff supervision should define the exact areas of responsibility and scope of authority for all staff using or maintaining the machine. If a member of staff lacks the necessary knowledge, he or she must receive due training and instruction.
- Any training or instruction required can be provided by the manufacturer or supplier.
- The supervisor must also make sure that the content of this manual is fully understood by the staff concerned.

Dangers arising from non-observance of safety instructions

- Danger to personnel and to the machine.
- Danger to the environment through leakage of hazardous substances.
- Loss of all entitlement to redress.

Safety conscious working

- In addition to the safety instructions given in this manual, it is essential to follow the national accident prevention directives currently in force and any internal regulations concerning work and safety.
- Duty of care - your personal safety, the safety of others, of the equipment and the environment is the responsibility of everyone.

Safety instructions for maintenance, inspection and installation

- Leakages of contaminated material must be discharged in such a way that neither personnel nor the environment are placed at risk. Statutory directives must be observed.
- All possible danger from electric shock must be eliminated (for details see the regulations of the country of authority and your local power supply company).
- Observe equipment warning signs.
- The supervisor must ensure that all maintenance, inspection and installation work is carried out by authorised and qualified skilled staff, who are duly informed about the machine and/or installation after studying the manual thoroughly.
- Work on the machine must only be carried out with the machine stopped and electrical power supply turned off at the isolator switch.
- Pumps or assemblies which convey, or are in contact with, harmful media must be decontaminated.
- All safety devices (Interlocks), must be refitted and be in working order immediately after the work is carried out, and their operations checked.

Arbitrary modifications and replacement of product parts

- Modifications or changes to the machine are only permissible after consulting with the manufacturer.
- Original spare parts and accessories authorised by the manufacturer contribute to safety.
- If unauthorised parts are used, this will exempt the manufacturer from liability for any consequences caused by the use of those unauthorised parts.

Unacceptable modes of operation

- The safe operation of the machine as delivered is guaranteed only if it is used within the manufacturer's guidelines. This machine was designed on the basis of specified conditions of operation contained within the conditions of purchase of the equipment. The specifications listed in the conditions of operation are to be regarded as limit values and must not be exceeded under any circumstances.
- All users should be made aware that, if the equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

3. Equipment description and specification

About the Quattro macerator

The Quattro was extended into two variants – the Vanguard Original and Vanguard Enhanced – in 2017. Both machines offer unparalleled superfine maceration and also built-in Biomaster silver antibacterial technology (tested to ISO 22196:2011) giving a lifetime protection against the growth of bacteria.

In 2019 the Vangaurd Solo dB was added to the range.

This range has additional enhanced features that can be personalised to each healthcare setting.

CSA model variants are:

	Foot pedal open / manual soft close	Hands-free open and close (automatic)	Deodoriser / disinfectant rinse cycle	Night mode	RFID Lock/Unlock
Quattro Vanguard Original	✓	-	✓	-	OPTION
Quattro Vanguard Enhanced	-	✓	✓	✓	OPTION
Quattro Vanguard Solo dB	-	✓	✓	✓	✓

Night mode noise level = 52 dBA Leq

All standard pulp items (bedpans, standard/large wash bowls, jugs, urine bottles/dishes, kidney dish, tray etc) can be disposed of in a Haigh macerator.

NHS Supply Chain has independently tested all the leading pulp supplier products in Haigh macerators in accordance with PAS29:1999 (a British Standards Institute [BSI] Product Assessment Specification).

How the Quattro works

Quattro consists of an electric motor which drives a pulveriser, with a separate water pump that flushes the hopper and outlet pipe-work.

Water is supplied via mains supply or a storage tank through an inlet solenoid valve. It uses cold water only. The solenoid valve is operated by the machine's printed circuit board (PCB) which receives a signal from a level switch mounted in the cistern. The water is drawn from the cistern by a separate pump and is discharged via the plumbing system into the machine. A measured quantity of deodoriser is fed into the plumbing towards the end of the cycle.

The internal surfaces of the lid and hopper are automatically washed down by the spray from a vent centrally mounted on the underside of the lid.

Switching on the wall isolator actuates the microprocessor which performs a safety monitoring assessment of the condition of the machine before the green ready to run light illuminates. The machine is now ready to start a cycle of operation.

The electrical safety system is continuously monitored by the internal microprocessor.

If a problem occurs, cycle termination devices end the cycle of operation and the respective warning or fault light will illuminate. For operation refer to the indicator panel.

WRAS This machine is a Water Regulations Advisory Scheme (WRAS), approved product with protection from contamination to the water supply provided by an Air gap to EN 13077, Family A, Type B.

The pulveriser

The pulveriser consists of an impeller rotating at high speed within a toothed cutter ring which forms the lower part of the stainless steel hopper assembly.

The impeller is fitted with two sweep blades which pulp the bedpans and urine bottles before the pulp passes on through the disposer.

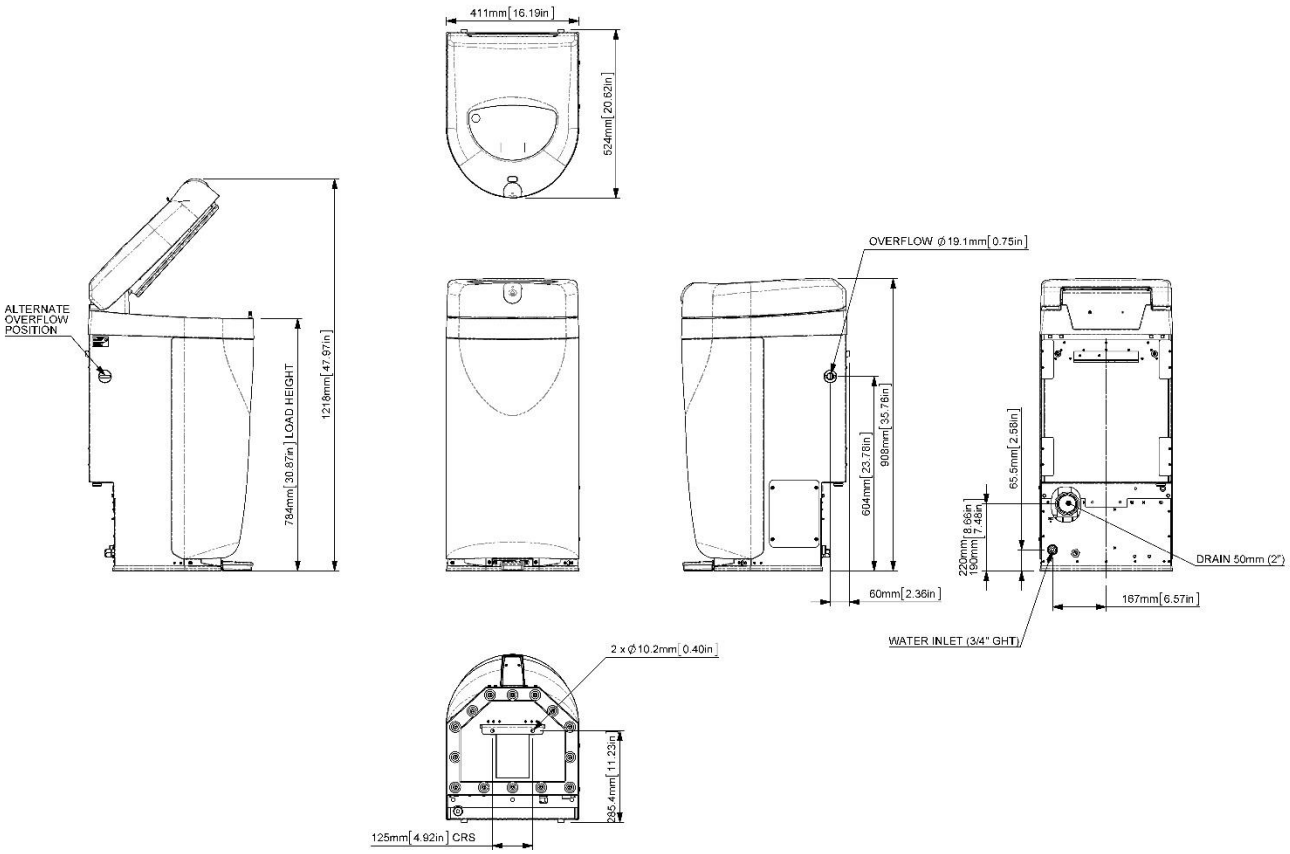
- Dispose of pulp products only e.g. bedpans and urine bottles.
- The machine is not designed to dispose of dressings, swabs, gloves etc as **these will jam the machine.**

Should an unsuitable object have been inadvertently placed in the machine and the impeller become jammed, the motor overload trip will operate to stop the machine and the red fault light will illuminate.

Always isolate the machine from mains electrical supply before servicing.

Remove the object and ensure the impeller is free to rotate. The overload trip device within the control box will automatically reset. Close and latch the lid.

Technical diagram



Specification

	Quattro Vanguard Solo dB
Size (W x D x H)	16.2 x 20.6 x 35.8 in (411 x 524 x 908 mm)
Capacity (pans/bottles)	1
Capacity (wash bowls)	1
Cistern capacity	3 US gallons (11 litres) Inlet protected by 'EN 13077, Family A, Type B'
Electrical supply	120 v / 1 Ph / 60 Hz
Energy use	0.01 KWh / cycle
Footprint	2.31 ft^2 (0.215 m^2)
Height (lid open)	47.97 in (1218 mm)
Humidity operating range	50-80% RH
Loading height	30.87 in (784 mm)
Motor power	600 w
Pump power	125 w
Temperature operating range	+41 to +104°F (+5 to +40°C)
Water requirements	Cold – 1.5 US gallons/min (5.5 lpm)
Weight (dry)	123 lbs (56 kg)
Open / close	Foot Pedal open and close
Auto-start	✓
Maintenance access	All sides
Cistern overflow indicator	Never connect the overflow indicator stub to the drain. Ensure any discharge is visible
Direction of rotation for macerator motor	Single phase machines are supplied with the correct rotation.
Isolator	For single and three phase machines, 20A isolator to National Electricity Code standards
Mains water inlet flow rate	Required flow rate is minimum of 1.5 US gallons/min (5.5 litres/min) Water regulated to 2.4 US gallons/min (9 litres/min) maximum
Mounting	Floor. 3/8" dia securing bolts (10mm dia securing bolts)
Pipework (mains)	Inlet 3/4" GHT female connection
Pipework (waste drain outlet)	50mm (2" HT) multifit P trap
Water pump	Self-primed from the cistern. Electric centrifugal pump

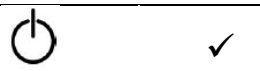
All installations must comply with statutory regulations, local water by-laws and relevant codes of practice of the country of installation. Responsibility for this must rest with the installer. Haigh make every effort to comply with national requirements/standards.

Cycle times

The cycle time is determined by the position of the drain (in relation to the macerator) and the requirements of the hospital; this will be agreed during installation.

	Cycle	Time (seconds)	Water usage (US gallons)	Water usage (Litres)
Solo dB	**V1**	180	4.75	18.0
	V1+	205	5.7	21.7
	Nightmode	255	5.2	19.6

OLED panel chart

	Ready / Standby (awake) Foot Pedal Locked
	Ready / Standby (awake) Foot Pedal Unlocked
	Lid opening initiated, (display flashes)
	Running
	Running, extended cycle
	Running, Night Mode

Identification of the symbols and indicator lights

	**Indicator light green**	Machine healthy
	**Indicator light amber**	Machine warning of attention required
	**Indicator light red**	Machine indicating fault. **Call for service engineer.** Please quote fault code when calling (see page 48)
	**Indicator light blue**	Machine in night mode
	**Water filling**	Rising until the tank is full. Illuminated on low water condition, after 180 seconds fault light also illuminates.
	**Drain block indicator**	Illuminated during a drain block cycle. On release, if water and pulp are still in the hopper covering the impeller, call the Service Engineer.
	**Low deodoriser**	Illuminated when deodoriser requires changing.

See page 48 for troubleshooting of the above indicators

How to operate the Quattro Vanguard Solo dB (hands free open and close)

1. The green indicator light will be illuminated (see OLED panel chart on page 15).
2. Present a compatible tag or card above the RFID reader symbol.

3. If successful, the machine will beep and the OLED screen will change to an unlocked status.

4. The foot pedal is now unlocked for a period of 20s.
5. Open the lid by pressing the foot pedal
6. Load the machine:

MAXIMUM load for this machine:

Disposable bedpans	**ONE**
Urine bottles	**ONE**
Wash bowls	**ONE**

DO NOT exceed this maximum loading

7. Press the foot pedal to close the lid.

DO NOT close the lid by hand

8. The lid will lock and the machine will start its cycle automatically
9. Once the cycle has finished, the foot pedal will remain locked until the next operation.

Training is recommended for users. Haigh can provide you with support should you require it. A poster for advising users who to operate the machine will be made available in your welcome pack (part number E5042) or can be printed from the following page.

Staff notice - automatic hands-free operation

Introducing the Quattro macerator to help prevent infections

Your ward has installed a hands-free Haigh macerator. As you only use the foot pedal to open and close the machine, this helps minimise infection contamination - a step change in infection control. To operate the macerator:

Do not close the lid manually. Use foot pedal

- **Do not close the lid manually. Use the foot pedal to open and close.**
- Take note of the items that you can and can't insert into the machine.
- Clean only with warm soapy water and disinfect with a non-corrosive disinfectant in accordance with its own instructions.
- Notify the hospital engineer if a continuous red light shows or the panel shows a fault.

E5043 05/2017

Put your foot down to stamp out infections

WARNING

Observe the risk of trapping when opening/closing the lid using the foot pedal. Before starting the process of opening and closing, check there is nobody near to the lid as trapping may have serious consequences.

Always operate the lid with caution.

Pinch protection

If something with sufficient resistance prevents the lid from closing then pinch protection is activated.

If an object is detected that would interfere with the lid closing, the lid stops and then reverses to the fully open position (if able to do so). An audible warning is given to indicate the reopening of the lid. Remove any obstructions and if the lid is open, press the foot pedal again to close the lid.

To stop the lid closing

This can be done by pressing the foot pedal. The lids movement is interrupted and it then reverses to the fully open position (if able to do so).

CAUTION

Do not attempt to manually close or open the lid when stationary or during automatic operation; this may cause damage to the hinge or latch actuators. In the event of this happening an audible warning may sound.

Operating advice

- Activate Quattro immediately after every load; do not leave the lid open.
- Wash hands after every load.
- Never use a chemical reaction substance to clear a drain block situation in the disposer as damage to the seals will occur.
- To reduce the possibility of the machine jamming, do not place the bedpans inside each other when placing them in the hopper.
- If electrical power to the machine fails during an operation cycle, the interlock remains engaged. The interlock releases once power is restored to the machine.
- Do not attempt to force the lid open or shut.

Daily maintenance

- Run the machine under ‘no load’ conditions to clear any residue.

How to use night mode

Night mode is an option available as standard on the Quattro Vanguard Solo dB.

A typical pulp macerator operates at 60 – 64dBA whereas when night mode is activated, it operates at just 52dBA Leq. This means you can continue to use macerators located in wards immediately as required.

The machine automatically switches to night mode during the hours of 11pm to 4am however the setting could be changed to suit whatever times you think are suitable for you. Speak to your facilities/estates team if you require this. If any further advice is required, contact one of Haigh's technical specialists on 01989 760 230 or email service@haigh.co.uk.

Only 1 x pulp item can be placed in the hopper during each cycle when in night mode. Please see cycle times for more information.

A poster for advising users how to set night mode manually will be made available in your welcome pack (publication number E5044) or can be printed from below:

Staff notice - Quattro night mode operation

Introducing night mode

Your ward has installed a Haigh macerator which incorporates night mode - an active mode tuned to run quieter to help your patients have a good night's sleep.

Night mode is pre-set for 11pm to 4am (contact your facilities team to set it to different hours). The blue light indicates it is on. To use night mode at other times, you can manually turn it on (or off) by following these instructions:

1 Button light in standby mode is green

2 Activate by pressing below the light for five seconds

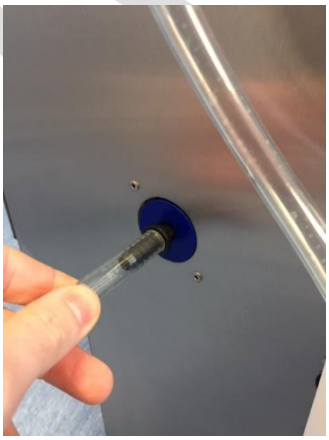
3 Light turns blue. Machine starts automatically

Only one (x1) pulp item per cycle on night mode

E5044 05/2017

Refilling the Disinfectant/Deodoriser bottle

If the **Low Deodoriser** appears on the screen please follow the below steps:

1. Fit the funnel bracket to the left hand side of the machine 	2. Secure the bracket by tightening the two thumb screws 	3. Place the funnel on the bracket in a tilted position 
4. Lower funnel into position 	5. Place the black filling nozzle into the blue refill point 	6. Fill the machine with a **MAXIMUM** of **2L** of deodoriser 

4. Installation and commissioning

Please read and familiarise yourself with the technical points contained in this section of the manual before installing this machine

Installation requirements

Quattro requires the following services for installation. Please refer to specification page for details.

- Cold water supply.
- Waste outlet connection - from internal ‘P’ trap to mains sewage only.
- Overflow - ensure indicator pipe discharge is visible.
- Electrical connection.

Installation planning

Consider location and availability of power, water supply and drainage

Note:

- Sufficient space should be allowed for the removal of the front panel and to service the machine.
- The machine must be level in both directions.
- Never allow the pump to run in a dry condition.

Cold water supply

Quattro is designed to operate on a minimum water flow rate of 1.5 US gallons per minute (5.5 litres/min). The supply into the cistern is regulated to a maximum of 2.4 US gallons per minute (9 litres/min) via a constant flow valve located in the inlet solenoid

To establish the flow rate the initial fill of the machine is timed:

Initial fill time	Flow rate
87 seconds	2.4 US gallons/min
142 seconds	1.5 US gallons/min

The machine is fitted with a flow regulator. For advice on low flow installations please contact your service representative

Break tank supply is permissible providing a minimum flow rate of 5.5 lpm is available at the machine connection.

- Ensure that the supply line to the machine is at no point less than 15mm, larger if the available head is very low.
- Ensure that the supply cannot be starved by other fittings.

- Ensure that the machine connection complies with statutory regulations, local water authority bylaws and relevant codes of practice.

A dedicated isolation valve (not supplied), must be fitted in the cold water supply pipework. It should be placed close to the machine so that it is readily accessible during maintenance or servicing

- A feed hose is required for connecting the machine to the water supply.
- The cistern is fitted to this machine and provided with an 'EN 13077, Family A, Type B' to prevent back syphon of contaminated water.

Under no circumstances may the cistern be bypassed

Waste outlet connection

Quattro is designed to be installed to 50mm pipework with a fall of 1:25 or sufficient to maintain a self-cleansing velocity

We recommend that the maximum total length of pipework before entering the 10mm vertical soil stack is 3m with one swept bend. If an additional swept bend is introduced then the maximum length would reduce to 2.5m

- Minimum size of waste pipe 50mm.

Connect the machine to the drain using the minimum number of long radius/swept bends. Use long radius or 'swept' bends - never short bends or 90° elbows:

- When a machine is installed on an existing drain then check that there is no calcium build-up as this reduces the efficiency of the drain and may lead to blockages.
- Provide easy access for rodding.
- The machine is fitted with a 50mm 'P' trap inside the cabinet terminating in a compression fitting suitable for a 50mm pipe stub. The outlet is for rear connection. Fitting a slow bend will allow for alternative connections through the floor / to the right / and to the left.

Never connect waste outlet to a septic tank

- Machine waste must be run separately to a 100mm vertical soil stack.
- Ensure the waste takes the shortest route to the soil stack.
- Ensure a clean run inside pipework - no burrs or reducing shoulders.
- Support plastic pipework adequately on runs to prevent sagging. Remember ceiling voids can get very warm.
- Avoid running the drain line near or across hot water pipes.

- A straight pipe run is preferable but if necessary any change of direction must be kept to a minimum, with an overall length run of two metres. However, if you need to exceed this length please contact Haigh for further assistance.

Overflow

The overflow indicator pipe from the integral cistern needs to be run to a suitable position. A 0.75” nominal push in socket is fitted to the cistern for customer connection.

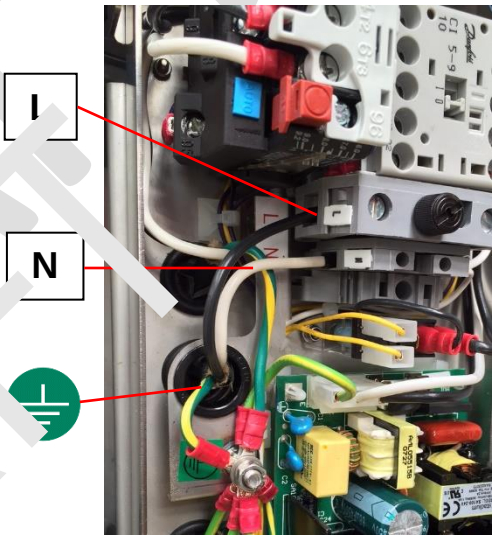
- Ensure that discharge from the overflow is visible.

Don’t connect the overflow directly into the soil drain. A tundish device may be used

Electrical information

Quattro is supplied for use on single phase power supplies; refer to the rating label details on the top of the electrical connection cover of the machine.

- **All electrical installations comply with current National Electrical Code regulations.**
- Appropriate National Electrical Code approved cables have been used.
- The appliance is connected to a protective ground connection via the ground terminal and identified by the ground label.
- **A dedicated, acceptable motor control switch with a marked OFF position shall be provided at the time of installation to disconnect the disposer from all ungrounded supply conductors.**
- **Isolator switch (customer supply) to be mounted adjacent and in sight of the appliance.**
- Electrical connection is made into the 120V Control Box.



- Mains cable to be routed through cable gland at rear of machine for strain relief.
- Mains cable to be routed through cable clamp located on base of machine.

Please Note: Mains cable is NOT supplied with machine

Circuit breakers / fusing

The following recommendations for electrical protection apply:

	Single phase
Rating	Refer to rating label
Required Circuit Breaker Rating	15 Amps
Connection cable	16 AWG

Existing installation

Where an isolator and a lead is already present from a previous installation, fit a junction box (not supplied) to the wall and connect the lead and the 2 metre flying lead of the machine into the junction box.

Ensure that the circuit breaker or fusing complies with the above table.

Storage

If the machine is not to be installed immediately, it should be stored in the carton in which it has been transported, in a clean, dry place which is free from vibration.

Undo the carton, lift the lid to periodically rotate the impeller by hand to prevent the mechanical seal seizing. Re-seal the carton after doing this.

Industrial gloves must be worn when working on or rotating the impeller by hand

If the machine has been stored, ensure that the impeller boss is free to rotate. The mechanical seal may have seized if it has not been revolved frequently or through water drying out. Result: motor will not start, or does start and damages seal faces. To free the mechanical seal:

- Remove the impeller and part the seal faces, lubricate with clean water only.
- A new mechanical seal will be required if faces are damaged as the seal will leak.

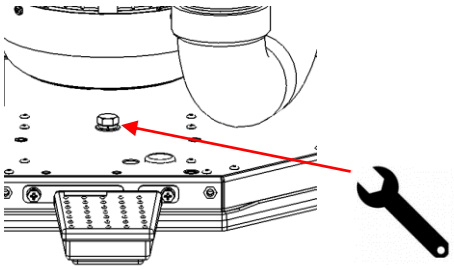
Note:

Industrial gloves must be worn when working on or rotating the impeller by hand

- Never put tools etc. on the cabinet top, these could damage the surface.
- Never allow the pump to run in a dry condition.

Unpacking the machine

1. Remove the carton and any packing materials
2. Remove the front panel screw, hold both sides of the front panel at the bottom and pull to release it and access the interior
3. Remove the electrical control box to access the central fixing down bolt



4. Remove the central fixing down bolt

   Floor Bracket Fastener Details:

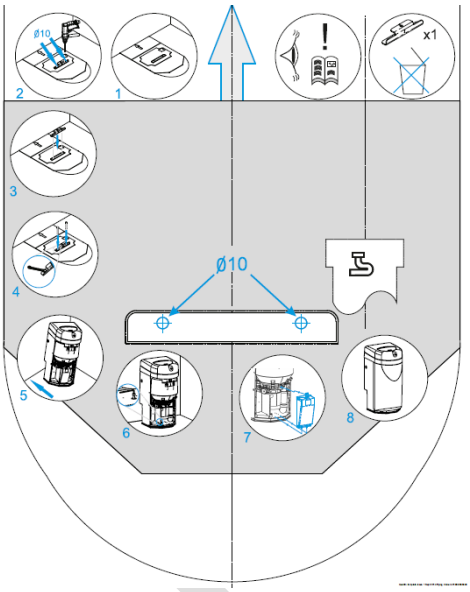
   Type: hexagonal Head (13 A/F)

   Size: M8 x 20mm

5. Replace the control box and remove the machine from the pallet
6. Remove the bolts that secure the floor locating bracket to the pallet. The floor locating bracket will be used to fix the machine to the floor and is positioned by using the template (supplied)
7. The machine is now ready for installation.

Installation procedure

Read and understand the preceding contents of this chapter



1. **Position the floor template -** Place the template in the desired position on the floor.

Ensure that there is sufficient clearance behind the machine for cleaning requirements

Before drilling, check and position the template to ensure that the holes do not affect under floor heating or other services

2. Drill holes - Place the floor locating bracket in the position indicated on the template and drill the fixing holes. Ensure the template is not moved while drilling.

3. Remove template - Take the template away and replace the floor locating bracket.

4. Secure the bracket - Using the desired floor fixing fasteners (not supplied) bolt the floor locating bracket to the floor. Ensure the floor locating bracket is fitted the correct way round as indicated on the template. The machine should be rigid with compression on the rubber mounting keeping the machine secure.

5. Position - Lift the rear of the machine centrally over the floor locating bracket. Slide the machine forward on the runners underneath, until the floor locating bracket locates in the two guide slots in the runners.

6. Secure the machine and connect services:
   - Replace the mounting base bolt under the motor to secure the machine in position.
   - Make the waste connection from the internal ‘P’ trap (to mains sewage only). Ensure the connecting pipe is cut square and deburred before fitting to prevent the waste snagging within the pipework and restricting the flow.
   - The cistern overflow indicator pipe discharge should remain visible to indicate an overflow condition. A tundish device is available as an option to direct overflow water to a drain.
   - Connect the mains cold water inlet supply. Open the inlet isolating valve.
   - Connect the flying lead supplied ready fitted to the machine, to the installation isolator. Note advice on electrical information page.
   - Turn on the electrical supply. The inlet solenoid valve opens to admit water to the cistern.
   - Continue with commissioning the machine. Ensure the rotational direction of the machine is correct. A direction of rotation label with cord tail is attached to the impeller in the hopper. The cord trail must indicate the trail towards the tick. This is only needed for the three phase machine.

7. Fit front panel - Refit the front panel. Secure with the front panel screw.

Commissioning

Commissioning must be carried out by person(s) suitably qualified and authorised to carry out mechanical and electrical maintenance.

Check that the machine is isolated from the electrical power supply. If not, isolate.

Mechanical checks

- Ensure the machine has been securely bolted down.
- Clean off any accumulated surface dust and dirt.
- Check inside the machine and surrounding area for tools, fasteners, rubbish or other foreign objects and remove them accordingly. Most problems which arise during the first hours of operation are caused by such matter.
- Check that the water is connected and turned on.
- Check that the drain is connected.

Electrical checks

- Check that the electrical connection is made in accordance with the previous section.

5. Maintenance and servicing procedures

Routine maintenance

WARNING: Maintenance of a Quattro should only be carried out by a qualified person.

Electrically isolate the machine before undertaking any routine maintenance.

Industrial gloves must be worn when working on or rotating the impeller by hand

Daily

- Run the machine under “no load” conditions to clear any residue.

Monthly

- Lid spray- remove any scale and replace.
- Check that the lid micro-switch and solenoid latch operate.
- Check for leakage from the pulveriser and water pump seals.

Quarterly

Water supply and drainage

- Check for leakage from the pulveriser or water pump seals.
- Check for leaks cold water supply pipe-work.
- Check that the machine is draining correctly.
- Check that the drain block pressure switch tube is clear of water.
- Check and clean solenoid filter or replace.

Mechanical

- Check wear on the hopper cutter ring/impeller.
- Check that the impeller is rotating freely and for absence of vibration.
- Inspect and tighten nuts and bolts as necessary.
- Check the condition of the lid/hopper seal, and that the lid opening gas spring operates correctly.
- Check the lid latch arrangement. Turn isolator off during an empty cycle to simulate a power loss and ensure that the solenoid has secured the latch in the locked position.

Electrical

- Check contactor is operating correctly in control gear.
- Check overload units operating and set correctly.
- Check lid positive break interlock switch operates correctly.
- Check electrical connections in control gear and motor terminal box are secure.
- Low water sensor and drain/hopper block pressure switch operate
- Functionally test the machine.

Cleaning recommendations

Electrically isolate the machine before cleaning

Never use a wet solution to clean the indicator panel

Daily

- All exterior panels to be wiped over with normal cleaning solution for worktops etc. (soapy water) and then dried.
- The best results are obtained by opening the lid which allows full access to the seating and the lid seal.
- All internal surfaces are automatically cleaned by the machine. Failure to do so must be investigated.

Weekly (as required)

- The lid seating area should be scrubbed with a brush, wiped and the neoprene seal washed with the same cleaning solution.

Lubrication

The machine is designed for minimum maintenance.

- The clip bushes used in this machine must ***not*** be lubricated.
- Apply anti-seize compound if indicated.
- The motor is fitted with sealed for life bearings.
- The mechanical seal face must be perfectly clean.
- Use only clean water to lubricate the seal face.

Ordering spare parts

Spares parts are identified on pages 34 to 45.

Please contact your local distributor for more information.

Please quote the following information:

- Your contact details
- The machine serial number
- The part number required
- The full part description
- The quantity of each part required
- The invoice address
- The delivery address.

Many parts are available within 24 hours. We can provide technical advice should you need it.

6. Part identification diagrams

Servicing Quattro

WARNING: Servicing of a Quattro must only be carried out by a qualified person.

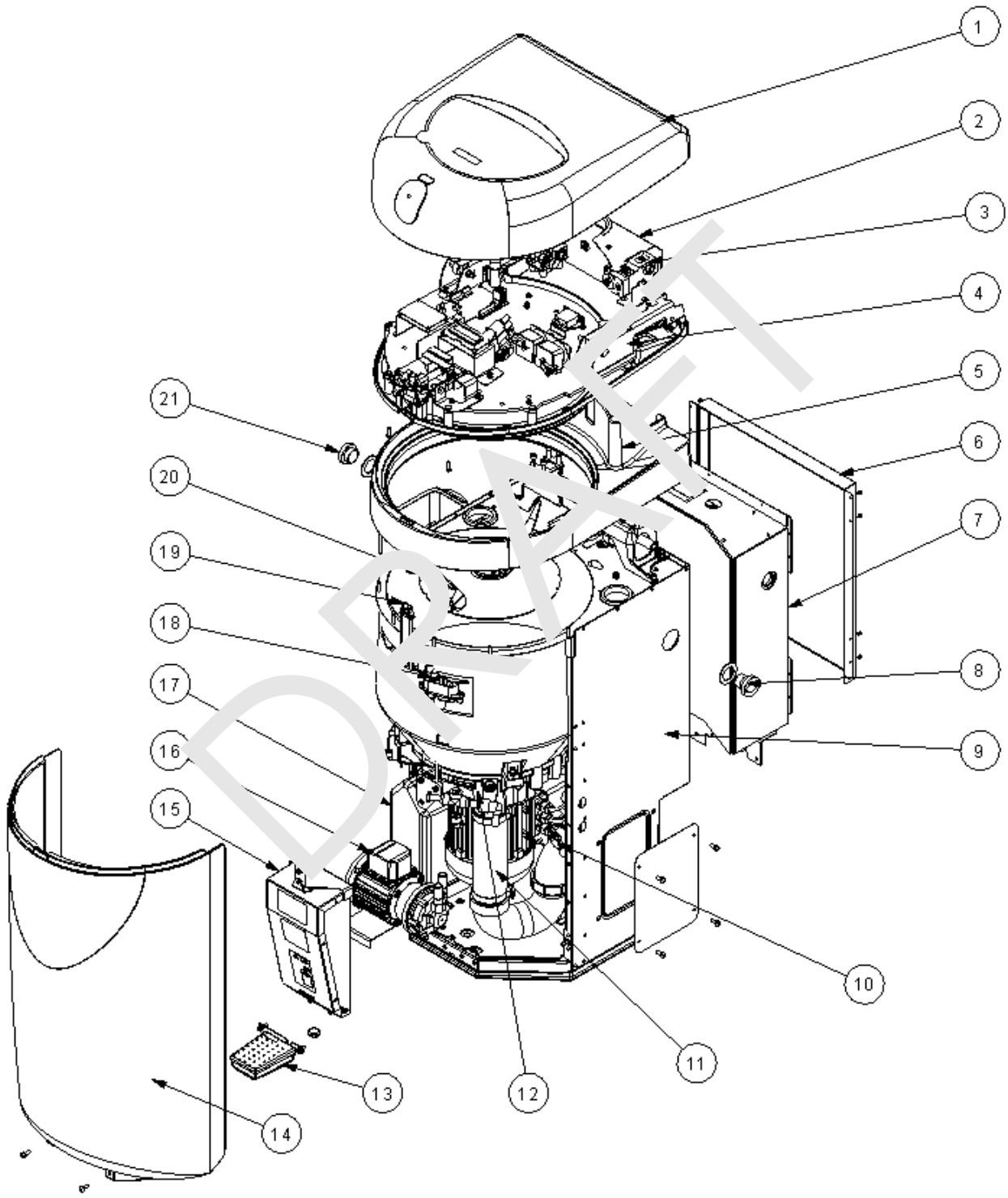
Ensure appropriate protective equipment is worn

ALWAYS isolate the machine from mains electrical supply before servicing

Isolate the water inlet to the pump at the service valve by turning the isolation screw 90°.
Reverse to vertical on completion.

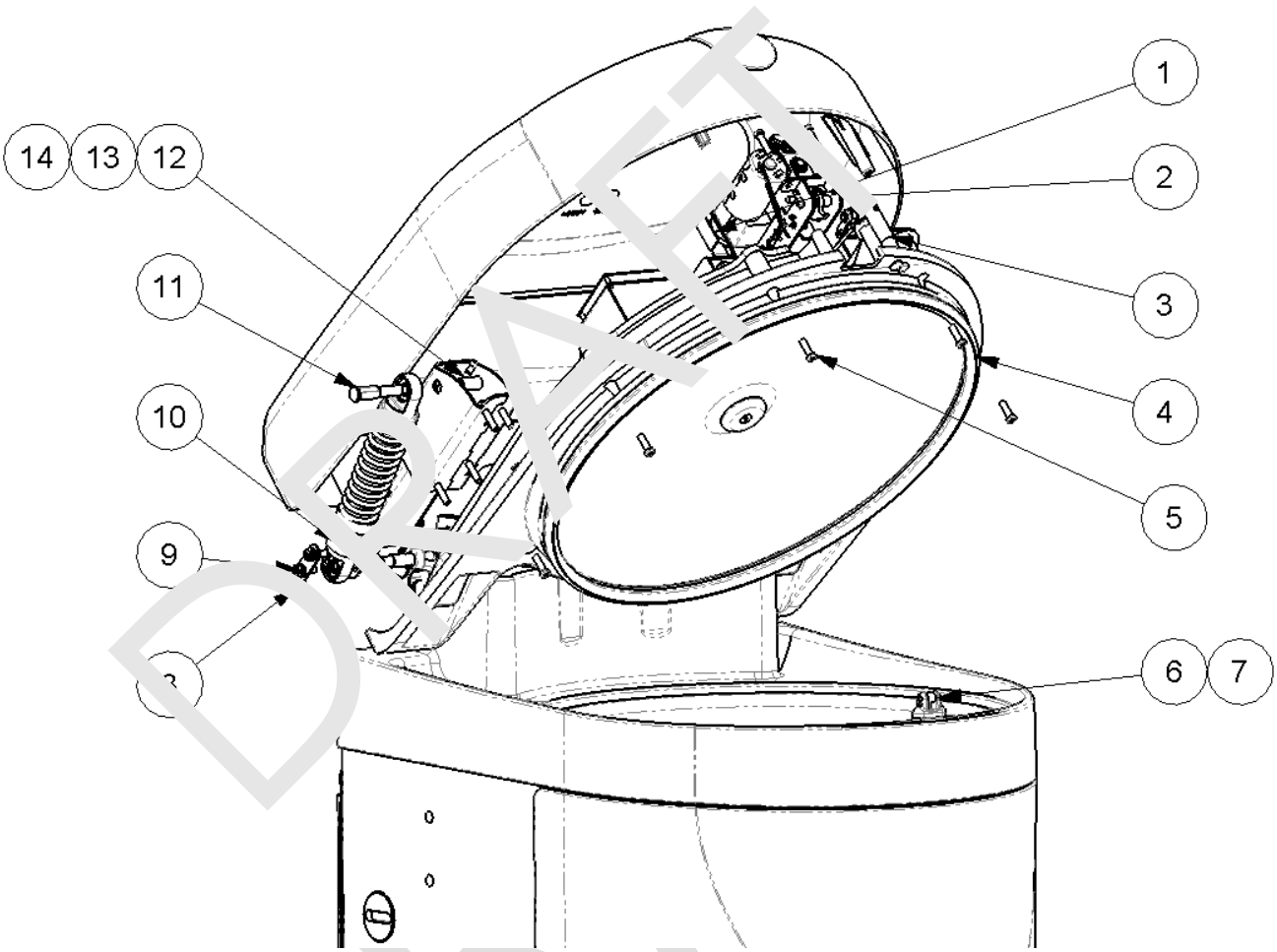
Denotes assembly step

General assembly



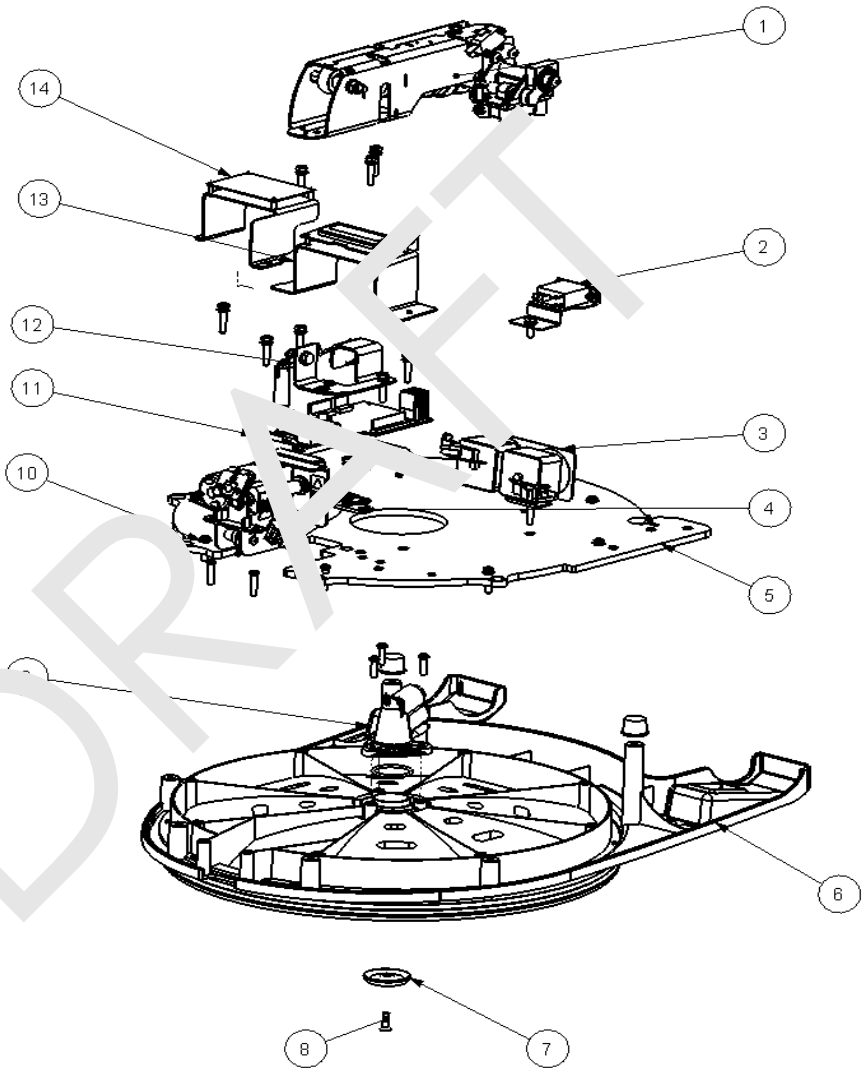
Item	Part number	Description	Qty
1	903-111570	Top Cover Assembly	
2	903-111851	Rear Cover Plate Assembly	1
3	901-113188	Hinge Actuator Assembly	1
4	905-111569	Lid Assembly (Vanguard)	1
	901-114320	Lid Assembly (Export)	
5	901-111591	Cabinet Top & Seal Assembly	1
6	901-114390	Cistern Baffle	1
7	902-111580	Cistern	1
8	901-111512	Overflow Fitting	1
9	901-114356	Frame & Top Plate Assembly	1
10	906-111694	Inlet Plumbing Assembly	1
11	907-110942	Drain Outlet Assembly	1
12	902-111567	Pulveriser Head Assembly	1
13	901-113409	Foot Pedal Assembly	1
14	903-111581	Front Cover Assembly	1
15	914-111503	Single Phase Ctrl Enclosure Assembly	1
16	912-111848	Single Phase Pump Assembly	1
17	902-111813	Internal Deodoriser Assembly	1
18	903-111598	Plumbing Assembly	1
19	901-111600	Striker Assembly	1
20	902-111576	Fine Maceration Impeller & Hub Cap Assembly	1
21	902-111512	Overflow Fitting	1

Lid (external)



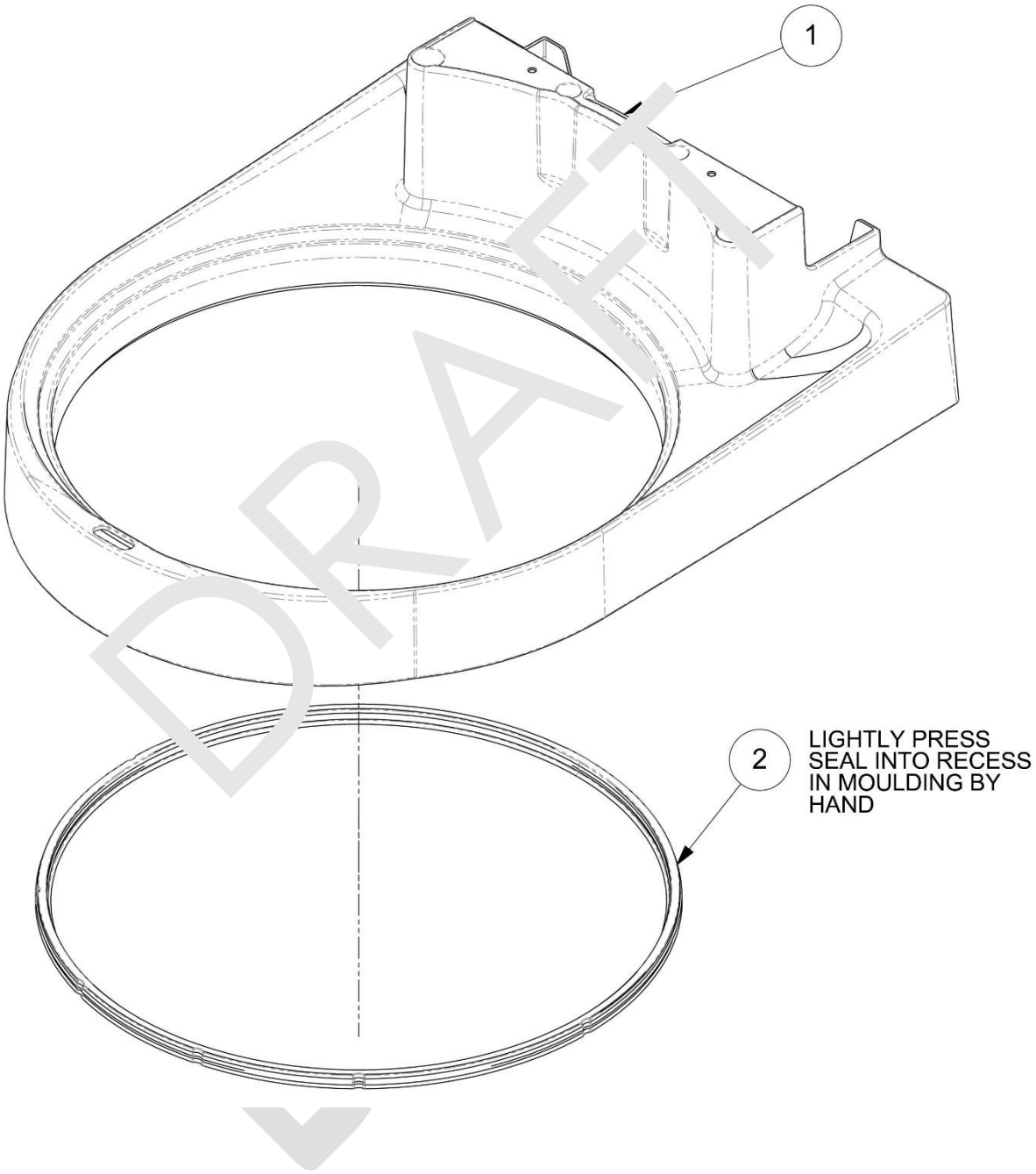
Item	Part number	Description	Qty
1	901-113042	Gear Cover	1
2	902-111199 901-113443	Latch Assembly (Vanguard Original Only) Latch Actuator (Vanguard Enhanced Only)	1
3	901-113793	Lid Closed Microswitch Assembly (Vanguard Enhanced Only)	1
4	901-111587	Lid Seal Assembly	1
5	901-107162	Screw	6
6	901-111600	Striker Assembly	1
7	901-111421	Striker Seal (included with Striker Assembly)	1
8	901-113376	Lower Lid Support	2
9		M5 SEMS Screw	6
10	904-111488	Un-damped Spring Assembly	1
11	901-111522	Hinge Pin	1
12	901-111523	Hinge Boss	1
13		Washer M6 Plain	1
14		Nut M6 Nyloc	1

Lid (internal)



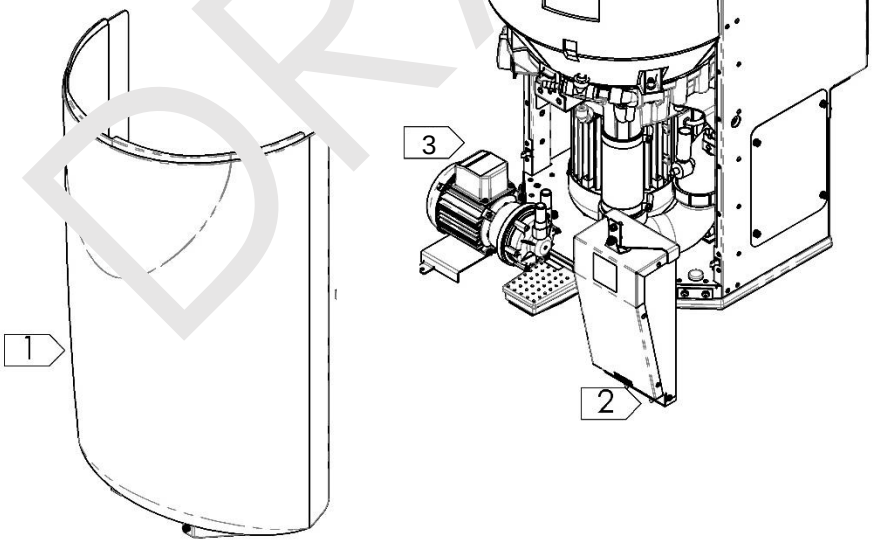
Item	Part number	Description	Qty
1	901-114563	Lid Arm Assembly	1
2	901-114524	Dual Float Switch Relay Assembly	1
3	901-112470	Pressure Switch Assembly	1
4	901-111547	Latch Packer	1
5	901-114341	Lid Plate	1
6	901-111587	Lid Seal Assembly	1
7	900-013486	Spray Vent	1
8	900-013522	Screw M5x16 SCKT CSK HD	1
9	901-111288	Spray Inlet	1
10	902-111516	Screw M5x20 Pozi Pan	10
11	902-111516	PCB	1
12	903-113793	Lid Closed Microswitch Assembly	1
13	901-114564	OLED Screen Assembly	1
14	901-114400	RFID Assembly	1

Top assembly of cabinet

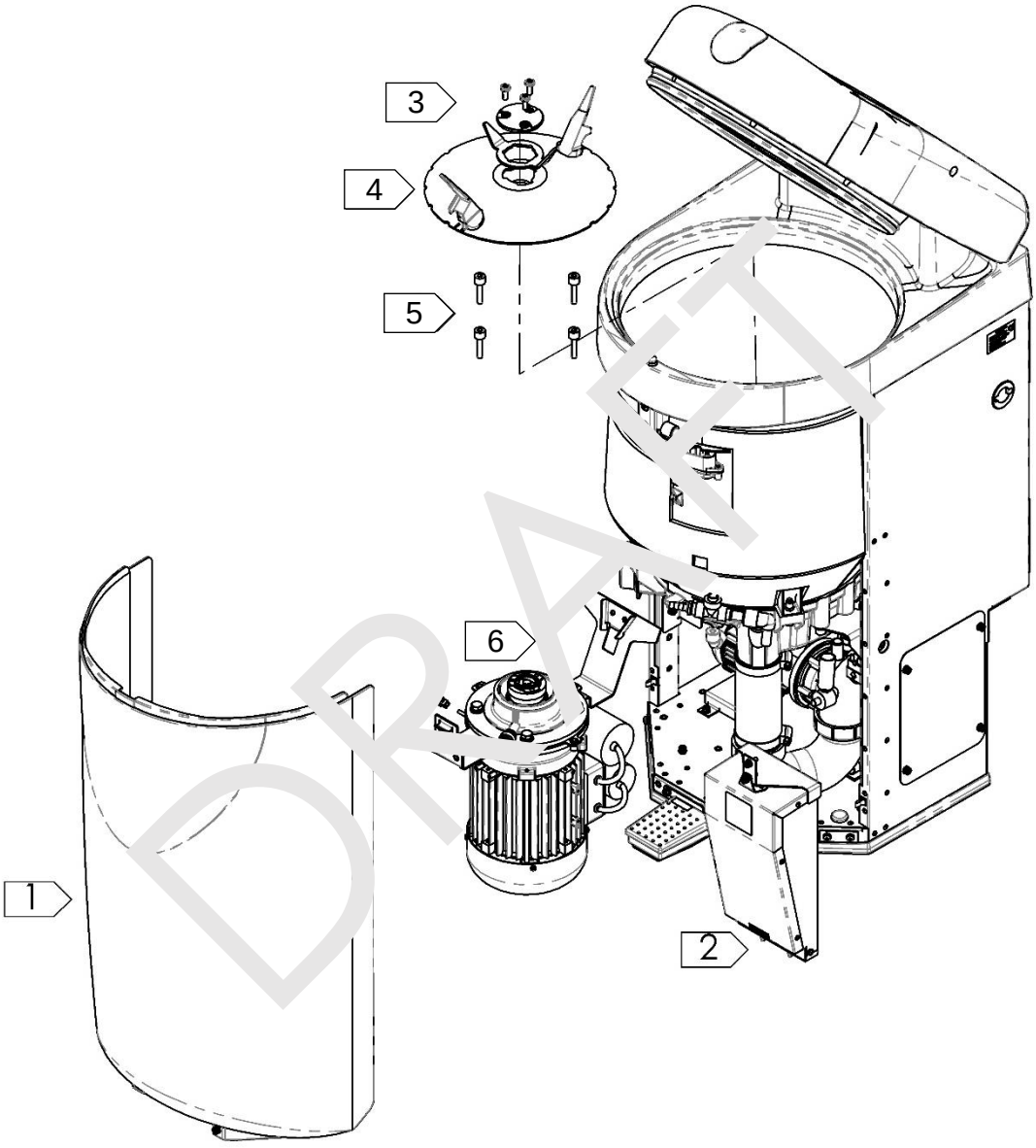


Item	Part number	Description	Qty
1	902-110877	Cabinet Top	1
2	901-111006	Hopper / Top Seal	1

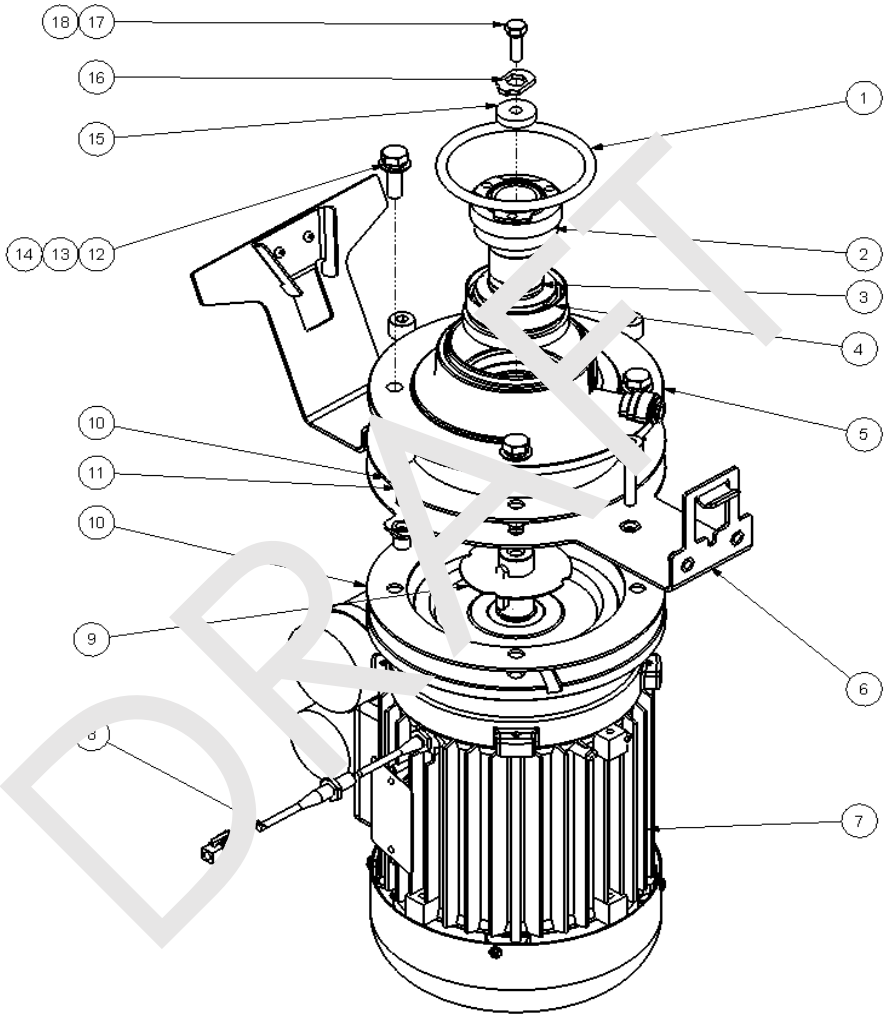
Main pump removal diagram



Mechanical assembly removal diagram

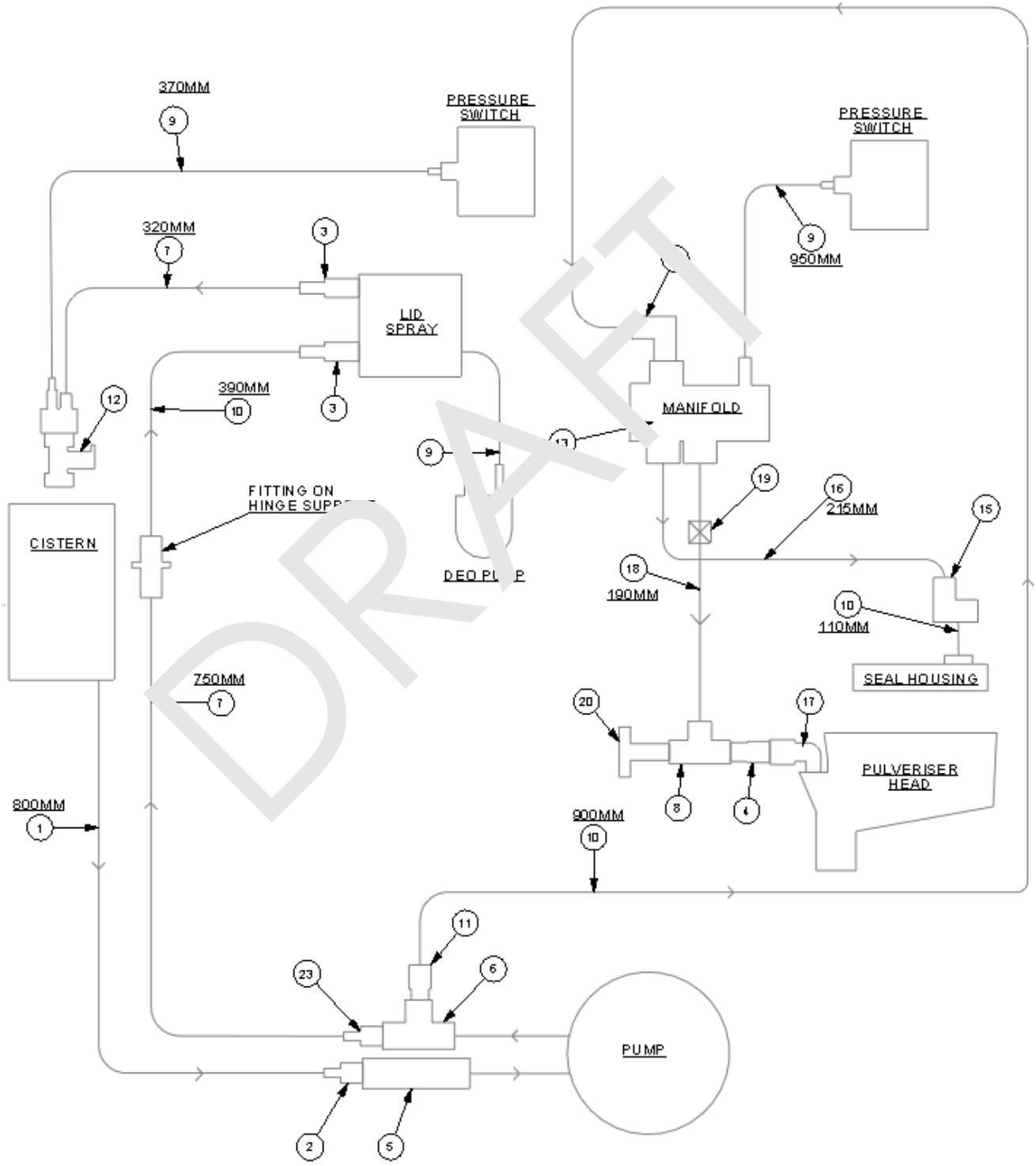


Mechanical assembly servicing diagram



Item	Part number	Description	Qty
1	955-051206	O Ring	1
2	901-013921	Impeller Hub	1
3	901-114581	Hub Spacer	1
4	901-013926	Mechanical Seal	1
5	901-111573	Seal Housing Assembly	1
6	901-111266	Motor Hinge Plate	1
7	910-014614	Motor 120V-1-60Hz	1
8	901-111578	Speed Sensor	1
9	901-013924	Water Thrower	1
10	901-114580	Anti-vibration pad	2
11	901-111568	Sealed Screw	4
12	728-006118	Screw M8x25 Hex Hd	4
13	709-006218	Washer 8mm Plain	4
14	704-006229	Washer 8mm Spring	4
15	901-013922	Hub Washer	1
16	901-013841	Lock Washer	1
17	728-006118	Screw M8x25 Hex Hd	4
18	703-006229	Washer 6mm Spring	

Plumbing diagram



Plumbing parts list

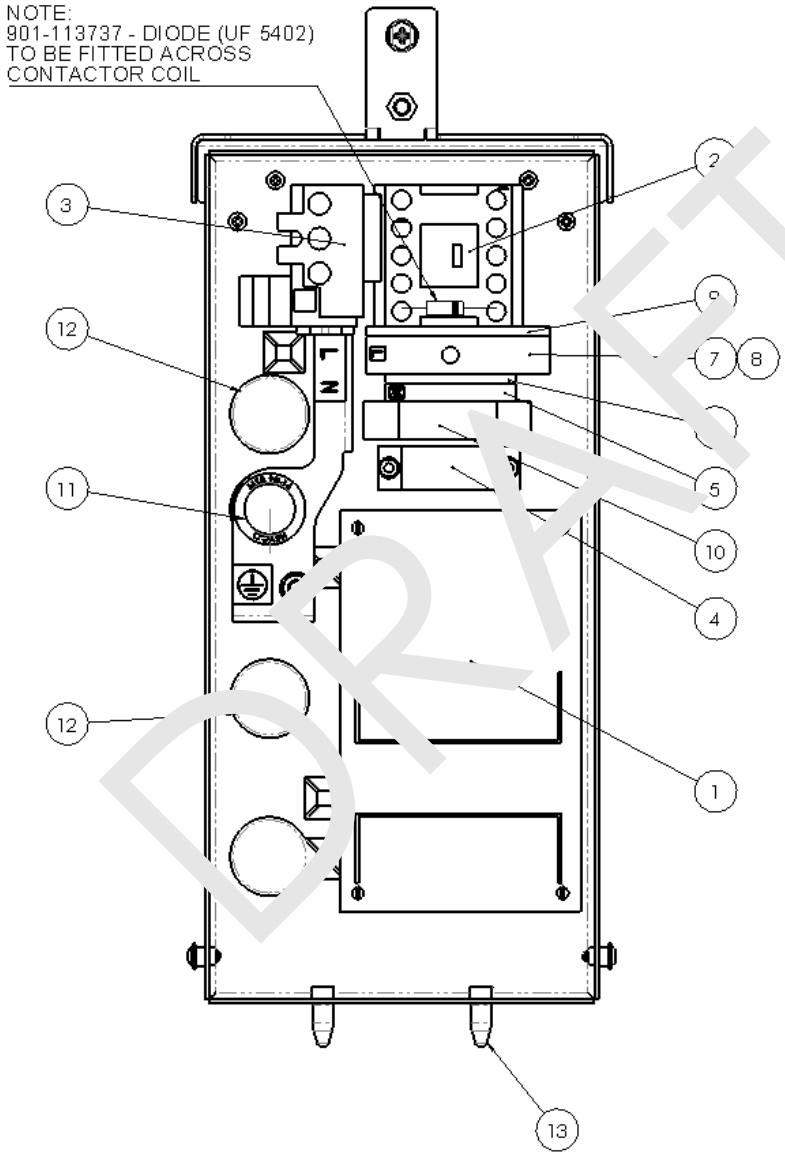
Item	Part number	Description	Qty
1	604-000131	Ø18mm X Ø13mm Braided Hose	800mm
2	904-111546	Hose Stub	1
3	901-111546	Hose Stub	2
4	907-111546	Hose Stub	1
5	901-013998	Service Valve	1
6	901-013958	Reducing T	1
7	527-000139	Ø13.5mm x Ø8mm Braided Hose	2030mm
8	901-101313	10mm Equal T	1
9	608-000131	Tube 3id X 6od Clear PVC	1320mm
10	628-000139	Tube Ø 8 X Ø 5,5	1010mm
11	902-013945	10mm x 8mm Reducer	1
12	902-111626	HPR Solenoid Assembly	1
13	901-110425	Manifold	1
14	901-013727	Stem Elbow 8 x 8	1
15	902-108636	Reducing Elbow 8-6	1
16	632-000139	Tube 6 x 4 JG LLDFE	215mm
17	900-013727	Stem Elbow 12 x 12	1
18	902-111626	HPR Solenoid Assembly	1
19	625-000139	Ø 10mm x Ø 8mm Nylon Tube	190mm
20	100-031036	Cable Tie Base 20 x 20	1
21	901-013775	10mm Plug	1
22	905-111546	Hose Stub	1

Note:

All hose fittings to be fastened with Jubilee Clip as follows:

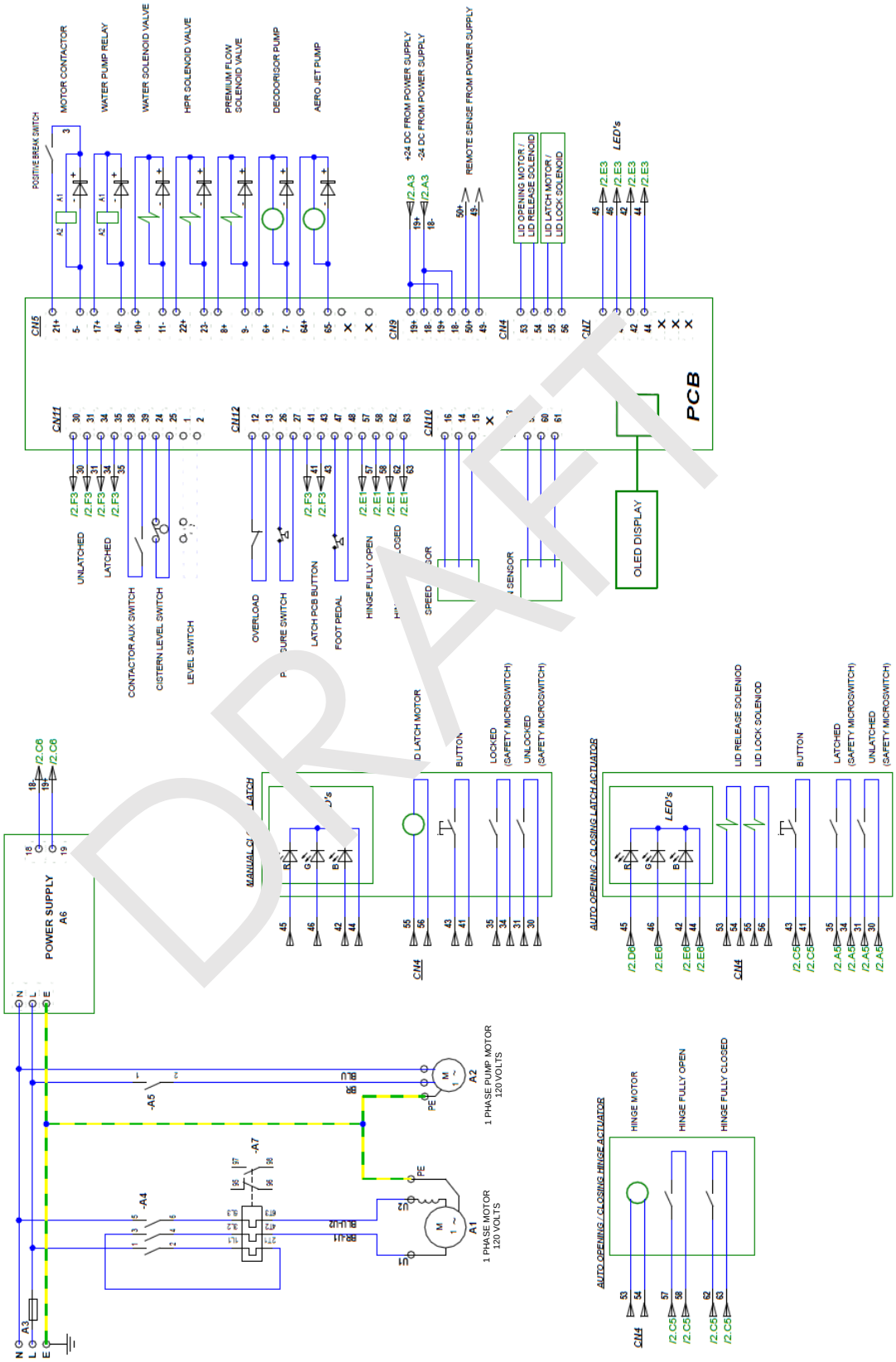
Hose part number	Jubilee clip size	Part number	Quantity
604-000131	00	703-006082	2
627-000139	M00	900-005293	10

Control enclosure



Item	Part number	Tag #	Description	1 ph.
1	901-111557	A6	Power Supply	1
2	900-030209	A4	Contactor	1
3	902-030154	A7	Overload Device 4.0-6.2A	1
4	106-031088	A5	Relay	1
5	100-031012	-	Grey Terminal	1
6	130-031012	-	End Cover	1
7	127-031012	-	Fused Terminal 15A	1
8	113-031099	A3	Fuse 12A HBC 20mm x 5mm Dia	1
9	128-031012	-	End Cover	1
10	129-031012	-	End Stop	1
11	108-031131	-	Snap Bush	1
12	902-111517	-	Grommet	4
13	901-016583	-	Location Peg	2

Wiring diagram – single phase



Control gear

Tag	Part number	Description	Function
A1	910-014614	Motor	
A2	902-100226*	Water Pump*	
A3	127-031012	Mains Fuse 15A (1Φ)	
	113-031099	Fuse 12A HBC 20mm x 5mm Dia	
A4	900-030209	Motor Contactor	Motor control
A5	106-031088	Water Pump Relay	Control water pump
A6	901-111557	Power Supply	Supply 24V DC output
A7	902-030154	Overload Device 4.0-6.2A	Motor control
	901-111630	Water Solenoid Valve	Mains water supply
PCB	902-111516	PCB	Logic Control
	901-111605*	HPR Solenoid Valve (RED Identifier)*	HPR
	901-103786*	Premium Flow Solenoid Valve (BLUE Identifier)*	Premium Flow
	901-030234	Lid Lock Solenoid (latching)	Lid Lock
	901-113443	Lid Latch Motor	Lid Lock
	n/a	Latched Micro-switch	Safety Monitoring
	n/a	Unlatched Micro-switch	Safety Monitoring
	902-107552	Lid Release Solenoid	Lid Release
	901-113188	Lid Opening Motor	Lid Open/Close
	n/a	Hinge Fully Open Micro-switch	Lid Open
	n/a	Hinge Fully Closed Micro-switch	Lid Closed
	901-111812*	Deodoriser Pump*	Deodoriser
	900-030183	Locked Micro-switch	Safety monitoring
	900-030183	Unlocked Micro-switch	Safety monitoring
	900-003940	Positive Break switch	Break contactor coil connection
	902-102108*	Cistern Level switch*	Low water level indication
	905-003571*	Pressure switch*	System pressure sensing
	n/a	Latch PCB Button	Signal to operate night mode
	901-111578	Speed sensor	Signal to indicate motor turning
	n/a	LED	Fault Indication
	n/a	Buzzer	Audible feedback regarding machine operation
	n/a	Foot Pedal	Lid Opening / Lid Closing
	902-113211	OLED	Visual feedback regarding machine operation

*Denotes component less fixing brackets

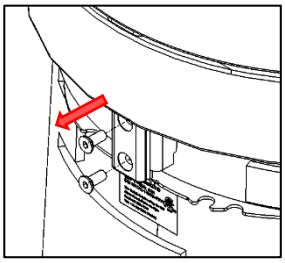
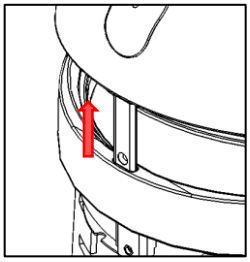
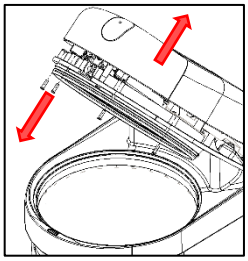
7. Fault finding

Electrically isolate the machine before any maintenance

Maintenance should only be performed by qualified personnel

Always check the indicator lights on the machine before calling maintenance staff, as simple remedies may work.

Problem	Possible causes / resolution
Machine is not clean internally after use	Lack of water or a failure to circulate within the machine. Check that the main water solenoid valve is operating. Make sure that the main isolating valve is open. Is the water isolator service valve in the 'Open' position? Check that the pump is working.
Underside of lid has a deposit after use	Check for foreign matter in the gap of the vent in the centre of the lid. If this is blocked, remove the vent, clean it and replace it. The jet gap must be the same around its circumference. If the problem is with the pump you will require an exchange unit for this part.
Lid seal is leaking	Check that the lid seal sits centrally on the lid gasket. Adjust and rectify, before making any adjustments to the latch mechanism. Remove any scum that has accumulated around the lid/hopper seal area.
Unable to open lid	Power failure. Auto-opening & Closing: The latch actuator is in the fully latched (locked) position. Manual Close: A solenoid on the latch mechanism locks the lid. In both instances, the lid cannot be opened until: Power to the machine has been restored or by releasing the Striker. Step 1. Remove the front cover. Step 2. Remove the 2 x Countersunk screws fastening the striker. Step 3. Lift the lid up by hand. The striker will lift with the lid. Step 4. Remove the 6 x Screws from the top cover. Step 5. Remove the top cover.

	   Once open check the operation of the latch and replace as necessary.
Unable to close lid	Foreign object present. Investigate and remove.
Internal water leakage	The pulveriser or pump mechanical seal is leaking: • Fit a new mechanical seal in the main assembly, or if the pump is leaking, exchange this for a new part. The plumbing is leaking: • Investigate where the leakage originates and rectify the problem • Damaged hopper seal therefore replace the hopper seal, ensuring that the new seal fits correctly.

Identification of fault codes

Problem	Possible causes / resolution
	Latch not engaged, display flashes
F3	Contactor circuit fault: • Check operation of rear positive break switch. • Main contactor fault. • Check contactor connections, replace contactor if necessary.
F4	Overload trip: Motor has tripped out on overload, probably jammed therefore switch off at isolator and remove the obstruction from the hopper.
F5 	Drain Block Stage 1: Pressure in hopper has built up to trigger the pressure switch but the machine recovered and continued.
F6 	**Drain Block Stage 2** Pressure in hopper: • Blockage in pulveriser exit or drain. Investigate the cause and clear the blockage. • Incorrect installation, pipe size, or position of waste pipework. 50mm minimum. • Non return/in line valves not operating correctly. Clean or replace as required. • Never use a reactive chemical drain block clearer within the machine as it will damage the seals.
F7 	Cistern fails to replenish with water after 150 seconds: • Lack of water in cistern: • Check that the mains inlet valve is open. • Check that there is sufficient water pressure. • Check and clean the inlet solenoid filter. • Check solenoid valve is operating. Replace if required.
F8 (Logged Only)	Water level fails to drop after 20 seconds: • Pump not operating or level sensor problem: • Check the pump and replace if faulty. • Check the cistern level switch and replace if faulty.
F9 (Logged Only)	Motor speed sensor failure: • Caution only, machine reverts to a safe state to ensure that motor has stopped before the interlock is released.
F10	Hinge Actuator Fault, Lid fails to open or close within 4s. • Check that nothing is obstructing the lid. • Check lid open and closed micro switches for continuity.

	• Check hinge actuator motor is working. • Clutch worn, increase spring tension.
F11	Latch Actuator Fault, Lid fails to latch or unlatch within 4s. • Check that nothing is obstructing the lid. • Check latched and unlatched micro switches for continuity. • Check latch actuator motor is working.
F12 (Logged Only)	Hinge Actuator Current monitoring, an object has been detected that would interfere with the lid closing.
F13 (Logged Only)	Latch Actuator Current monitoring, an object has been detected that would interfere with the lid latching.
F14 (Logged Only)	Lid Closed Manually, Lid closed without foot pedal activation.
F15	Latch Actuator Current Monitoring (F13) triggered consecutively 3 times.
	No indicators illuminated: • Power failure • No power to machine. • Check indicator membrane is connected properly. • Check fuses / electrical connections.