HAIGH

Operating and maintenance manual
Quattro Vanguard and Excel

Your technical and user guide to the Quattro Vanguard and Excel range of pulp product macerators for operators and service engineers

DESIGNED, MANUFACTURED AND ASSEMBLED IN THE UK
RELIABILITY AS STANDARD

Contents

1. Introduction 4
2. Safety precautions and procedures 5
   - Safety symbols 5
   - Electrical safety 5
   - Preliminary operating advice 5
   - Staff qualifications and training 6
   - Dangers arising from non-observance of safety instructions 6
   - Safety conscious working 6
   - Safety instructions for maintenance, inspection and installation 6
   - Arbitrary modifications and replacement of product parts 7
   - Unacceptable modes of operation 7
3. Equipment description and specification 8
   - About the Quattro macerator 8
   - How the Quattro works 9
   - The pulveriser 9
   - Technical diagram 10
   - Specification 11
   - Cycle times 13
   - OLED panel chart 14
   - Identification of the symbols and indicator lights 14
4. User operation instructions and care 15
   - How to operate the Quattro Vanguard (manual) 15
   - How to operate the Quattro Vanguard (hands-free option) and Excel 17
   - How to use night mode 20
   - Replacing the TECcare CONTROL bottle 21
5. Installation and commissioning 22
   - Installation requirements 22
   - Installation planning 22
   - Cold water supply 22
   - Waste outlet connection 23
   - Overflow 24
   - Electrical information 24
   - Circuit breakers / fusing 24
   - Existing installation 24
   - Storage 25
   - Unpacking the machine 25
   - Installation procedure 26
   - Commissioning 27
6. Maintenance and servicing procedures 28
   - Routine maintenance 28

Cleaning recommendations 29
Lubrication 29
Ordering spare parts 29
7. Part identification diagrams 30
Servicing Quattro 30
General assembly 31
Lid (external) 33
Lid (internal) 34
Top assembly of cabinet 35
Latch assembly (manual closing only) 36
Main pump and aero-jet pump removal diagram 37
Mechanical assembly diagram 38
Mechanical assembly servicing diagram 39
Plumbing diagram 40
Plumbing parts list 41
Control enclosure 42
Wiring diagram – single phase 43
Wiring diagram – 3 phase 44
Control gear 45
8. Fault finding 46
Identification of fault codes 48
9. EC Declaration of Conformity 50
10. Warranty 51

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.

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2. Safety precautions and procedures

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

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

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

This signifies the risk of electric shock to personnel and is a warning against electric voltage:

- Single Phase supply - 230V
- Three Phase supply - 400V

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

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 ranges – the Vanguard and Excel – 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.

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

UK models are:

	Foot pedal open / manual soft close	Hands-free open and close (automatic)	TECcare rinse cycle	TECcare wick system	Aero-jet drain flush	One-shot TECcare foam flush	Night mode
Quattro Vanguard Original	✓	-	-	-	-	-	-
Quattro Vanguard Enhanced drain control	✓	-	✓	-	✓	✓	option
Quattro Vanguard Enhanced infection control	-	✓	✓	option	✓	✓	option
Quattro Excel	-	✓	✓	✓	✓	✓	✓

International models are:

	Foot pedal open / manual soft close	Hands-free open and close (automatic)	TECcare rinse cycle	TECcare wick system	Aero-jet drain flush	One-shot TECcare foam flush	Night mode
Quattro Vanguard Original	✓	-	✓	-	-	-	-
Quattro Vanguard Enhanced	-	✓	✓	-	-	-	✓
Quattro Excel	-	✓	✓	✓	✓	✓	✓

Night mode noise level = 54dBA

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.

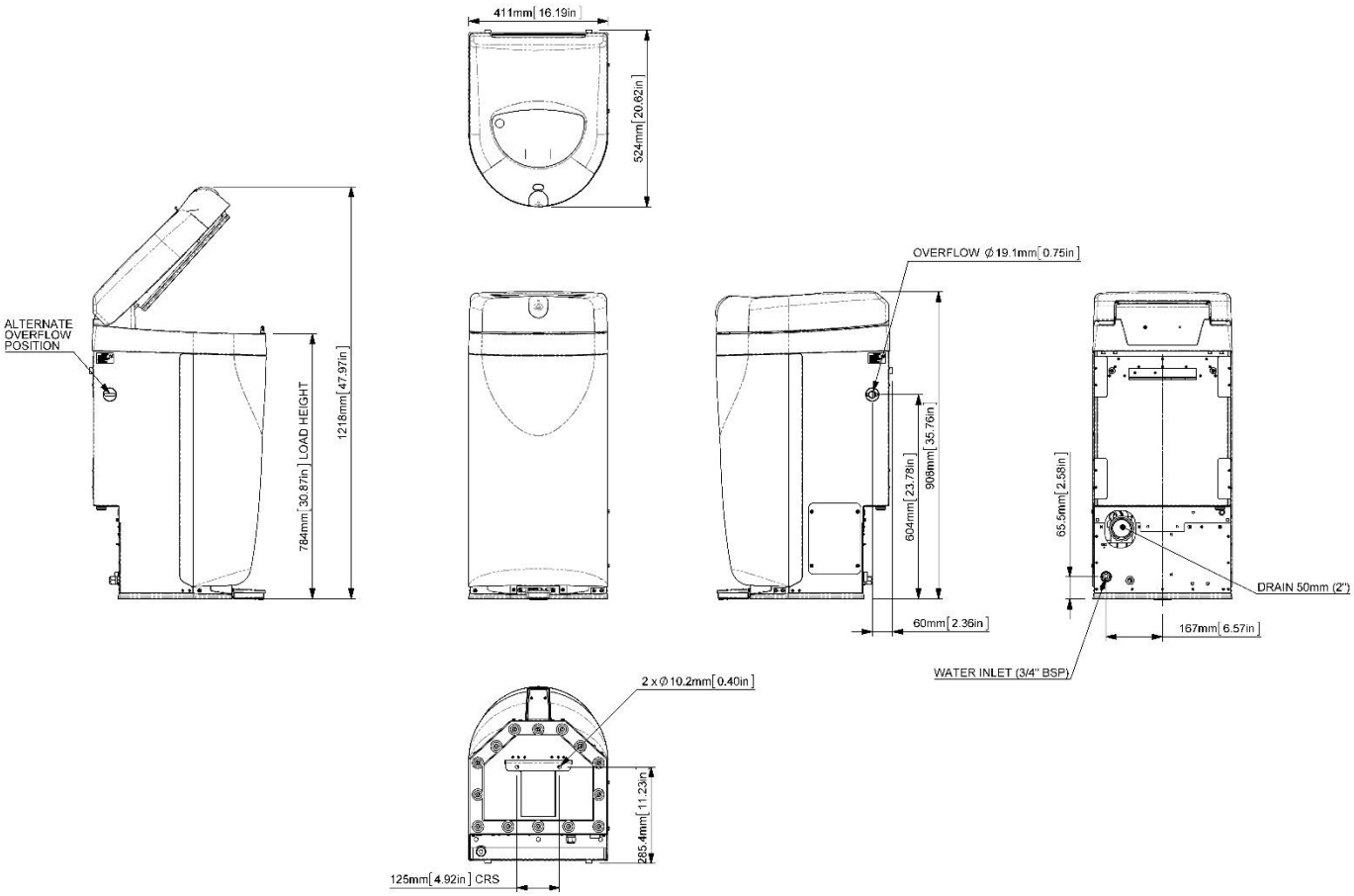
- Dispose of pulp products only e.g. bedpans and urine bottles.
- The machine is not designed to dispose of dressings, swabs, gloves etc as **these will jam the machine.**

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	Quattro Excel
Metrics		
Size (W x D x H)	411 x 524 x 908 mm	411 x 524 x 908 mm
Capacity (pans/bottles)	4 pans	4 pans
Capacity (wash bowls)	2	2
Cistern capacity	11 litres. Inlet protected by 'EN 13077, Family A, Type B'	11 litres. Inlet protected by 'EN 13077, Family A, Type B'
Electrical supply	230 v / 1 Ph / 50 Hz 400 v / 3 Ph / 50 Hz	230 v / 1 Ph / 50 Hz 400 v / 3 Ph / 50 Hz
Energy use	0.01 KWh / cycle	0.01 KWh / cycle
Footprint	0.215 m^2	0.215 m^2
Height (lid open)	1218 mm	1218 mm
Humidity operating range	50-80% RH	50-80% RH
Loading height	784 mm	784 mm
Motor power	600 w	600 w
Pump power	125 w	125 w
Temperature operating range	+5 to +40°C	+5 to +40°C
Volume	0.236 m3	0.236 m3
Water requirements	Cold – 5.5 lpm	Cold – 5.5 lpm
Weight (dry)	56 kg	58.5 kg
User handling		
Open / close	Manual open / soft close or Automatic hands-free	Automatic hands-free
Auto-start	✓	✓
Maintenance access	All sides	All sides
Installation		
Cistern overflow indicator	Never connect the overflow indicator stub to the drain. Ensure any discharge is visible	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. Three phase machines must be checked. - Clockwise direction only when looking into the hopper. Refer to Commissioning section.	Single phase machines are supplied with the correct rotation. Three phase machines must be checked. - Clockwise direction only when looking into the hopper. Refer to Commissioning section.

Isolator	For single and three phase machines, 20A isolator to IEC standards	For single and three phase machines, 20A isolator to IEC standards
Mains water inlet flow rate	Required flow rate is minimum of 5.5 litres/min. Water regulated to 9 litres/min maximum	Required flow rate is minimum of 5.5 litres/min. Water regulated to 9 litres/min maximum
Mounting	Floor. 10mm dia securing bolts	Floor. 10mm dia securing bolts
Pipework (mains)	Inlet ¾” BSP female connection	Inlet ¾” BSP female connection
Pipework (waste drain outlet)	50mm (2” BSP) multifit P trap	50mm (2” BSP) multifit P trap
Water pump	Self-primed from the cistern. Electric centrifugal 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 (litres)	Features
Vanguard	**C1**	82	17	
	C1+	109	19.1	
	C2	96	18.3	
	C2+	116	20.5	
	C3	114	20.9	
	C3+	137	24	
Excel	**C1**	91	17.3	Includes aero-jet
	C1+	111	19.5	Includes aero-jet
	C2	98	18.7	Includes aero-jet
	C2+	118	21	Includes aero-jet
	C3	118	21.8	Includes aero-jet
	C3+	141	24.4	Includes aero-jet

There are also optional cycles available:

Cycle	Time (seconds)	Water usage (litres)	Capacity	Comments
Vanguard Flush mode	35	11.2	0	
Excel Flush mode	35	8.8	0	Includes aero-jet
Nightmode	265	23.5	1 pan	Includes aero-jet

OLED panel chart

	✓	Ready / Standby (awake)
	✓	Lid opening initiated, (display flashes)
	✓	Running
	✓	Running, extended cycle

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.

See page 48 for troubleshooting of the above indicators

4. User operation instructions and care

How to operate the Quattro Vanguard (manual)

1. The green indicator light will be illuminated (see LCD panel chart on page 14)
2. Open the lid by pressing the foot pedal
3. Load the machine:

MAXIMUM load for this machine:

Disposable bedpans	Four
Urine bottles	Four
Any combination of products above	Four
Wash bowls	Two

DO NOT exceed this maximum loading

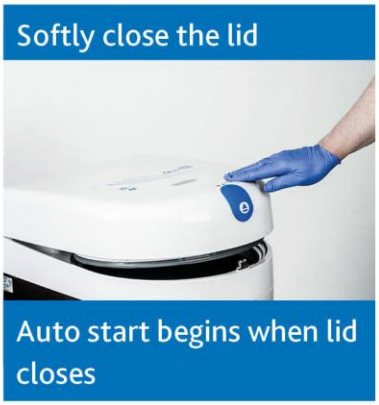
4. Close the lid. The lid will lock and the machine will start its cycle automatically
5. Once the cycle has finished, the lid can be opened (by foot pedal) for the next operation.

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 - manual Quattro operation

Introducing your Quattro macerator

Your ward has installed a Haigh macerator which uses a foot pedal to open the lid and should be softly closed by hand. The machine will automatically start once closed. To operate the macerator:



Use the foot pedal to open the lid.

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.

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Call us on 01989 760 230 or email service@haigh.co.uk for technical support

E5039 05/2017

How to operate the Quattro Vanguard (hands-free option) and Excel

1. The green indicator light will be illuminated (see LCD panel chart on page 14)
2. Open the lid by pressing the foot pedal
3. Load the machine:

MAXIMUM load for this machine:

Disposable bedpans	Four
Urine bottles	Four
Any combination of products above	Four
Wash bowls	Two

DO NOT exceed this maximum loading

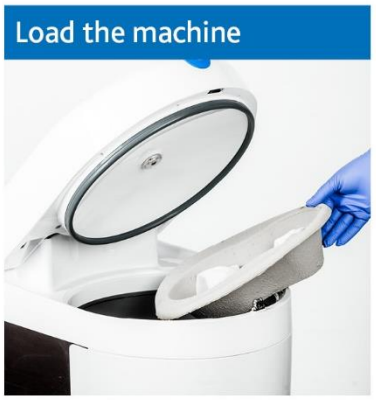
4. Close the lid using the foot pedal. The lid will lock and the machine will start its cycle automatically
5. Once the cycle has finished, the lid can be opened (by foot pedal) for the next operation.

Training is recommended for users. Haigh can provide you with support should you require it. A poster for advising users who operate the machine will be made available in your welcome pack (publication number E5043) or can be printed from page 16.

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.

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 on selected models of the Quattro Vanguard and is standard on the Quattro Excel.

A typical pulp macerator operates at 60 – 64dBA whereas when night mode is activated, it operates at just 54dBA. 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.

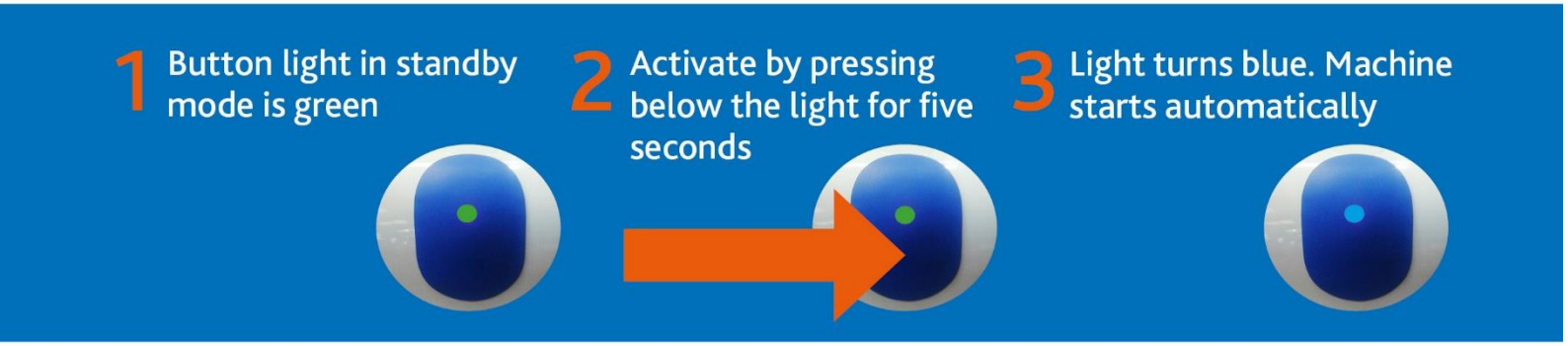
A poster for advising users how to set night mode manually will be made available in your welcome pack (publication number E5044) or can be printed from below:

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:



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

E5044 05/2017

Replacing the TECcare CONTROL bottle

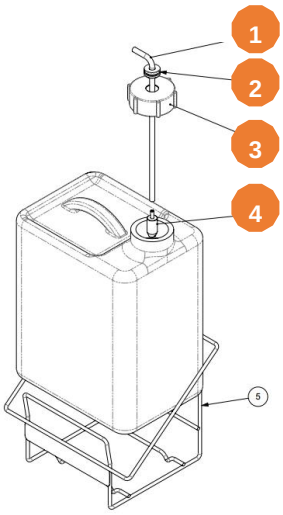
TECcare CONTROL can be ordered through the NHS Supply Chain using product code FAM10405 (if you're a UK NHS customer) or through your distributor (if you are unable to order through the NHS Supply Chain). It is available in units of two (x2) 5 litre bottles.

It is placed outside the macerator in a basket which is mounted to the wall. If you do not already have a basket, it can be ordered from Haigh using part number 901-112251.

1. Remove the cap from the bottle.

2. Replace with cap supplied with Quattro.

3. If you don't have modified cap, order the conversion kit (part number 401-061003). It includes a tube (1), grommet (2), cap (3) and weight (4).



4. Ensuring the tube is fed so that there is excess tube at the bottom of the bottle, screw on the lid.

5. Place the bottle into the basket

5. 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 5.5 lpm. The supply into the cistern is regulated to a maximum of 9 lpm 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	9 litres per minute (lpm)
142 seconds	5.5 litres per minute (lpm)

The flow regulator may not be removed to improve the flow as this will invalidate the machines WRAS approval. 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 1” 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 either single phase or three 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 I.E.E. regulations

- Appropriate I.E.C. approved cables have been used.
- The appliance is connected to a protective earth connection via the earth terminal and identified by the earthing label.

Isolator (customer supply) to be mounted adjacent to appliance

- A 2 metre cable flying lead is supplied ready fitted to the machine for connection to the customer’s isolator.
- Mains supplies always to be protected by I.E.C. approved circuit breakers or fuses.
- The thermal relay overload device in the motor circuit should always be set for a value corresponding to the rated overload current (O.C.) of the motor. The overload is pre-set before leaving the factory in the automatic reset mode.

Circuit breakers / fusing

The following recommendations for electrical protection apply:

	Single phase	Three phase
Rating	Refer to rating label	
MCB to ESEN 60898 Type D	6 Amp	4 Amp
Fuse to BS 88 HRC	13 Amp	6 Amp
Connection cable	1.5mm^2	

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

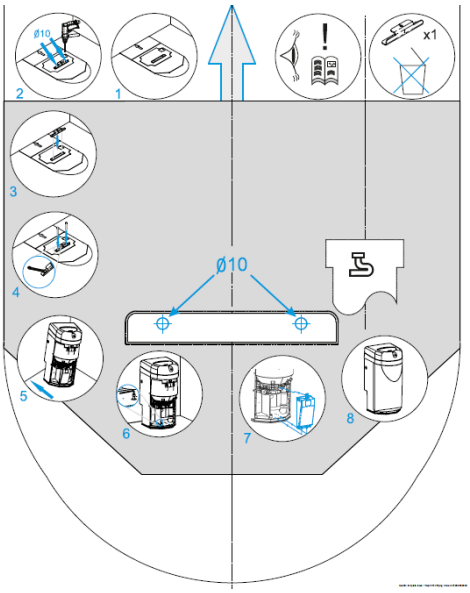
- Never put tools etc. on the cabinet top, these could damage the surface.
- Never allow the pump to run in a dry condition.

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
5. 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.

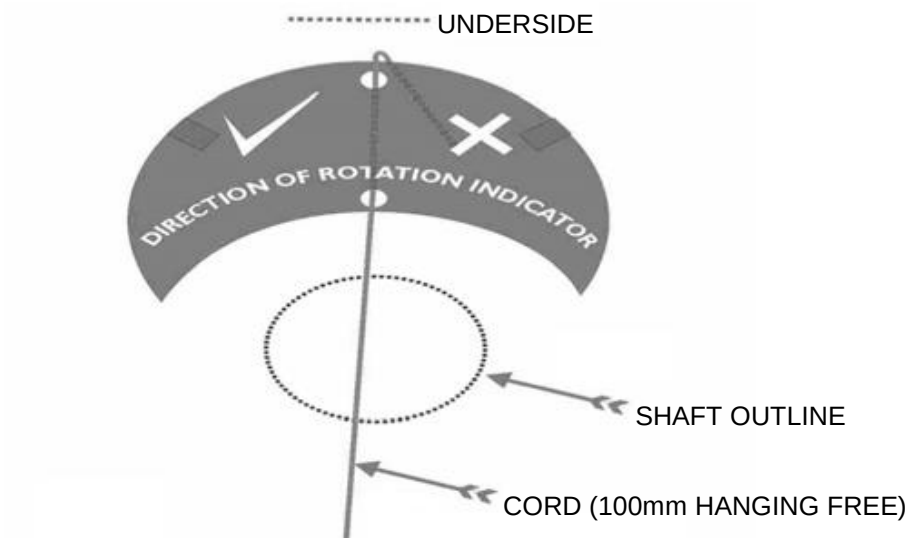
Electrical checks

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

Impeller direction of rotation - three phase machines only

The rotational direction of a single phase machine is correct when dispatched, but a three phase motor can be wired correctly when testing at the factory but incorrectly when the machine is installed. Pulp products remaining in the hopper is the result of incorrect rotation.

- Open the lid and look into the hopper to see the rotation indicator label and cord that is affixed to the impeller.
- Close the lid and start the machine.
- Open the lid after the cycle is completed and observe the direction of the resulting cord trail.
- If the direction is towards the 'X' the motor is revolving in the wrong direction. If so reverse the phases at the connection to the isolator.



6. 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 31 to 45 and can be ordered directly from Haigh:

+44 (0)1989 760 230

service@haigh.co.uk

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.

7. Part identification diagrams

Servicing Quattro

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

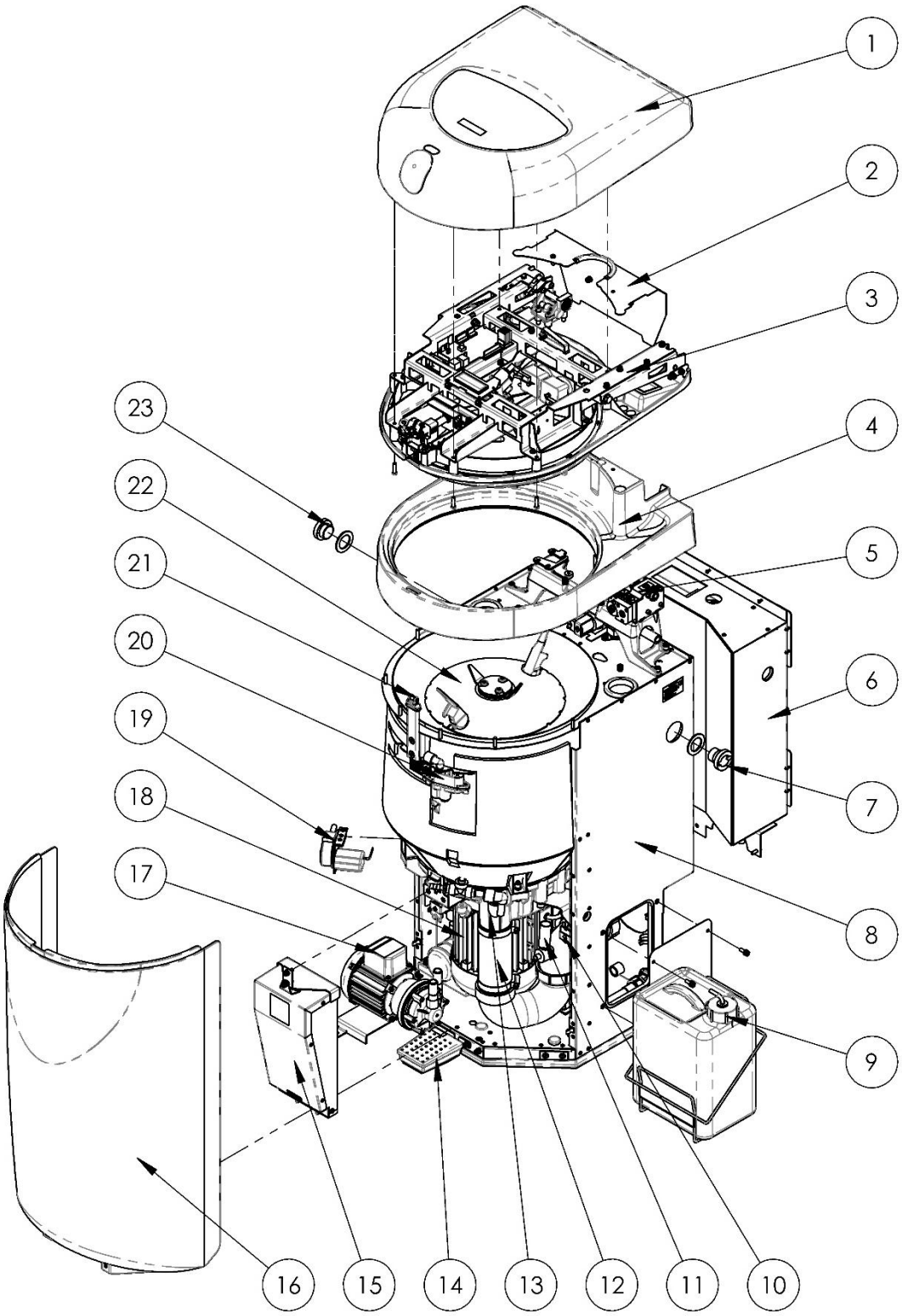
Ensure appropriate protective equipment is worn

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.

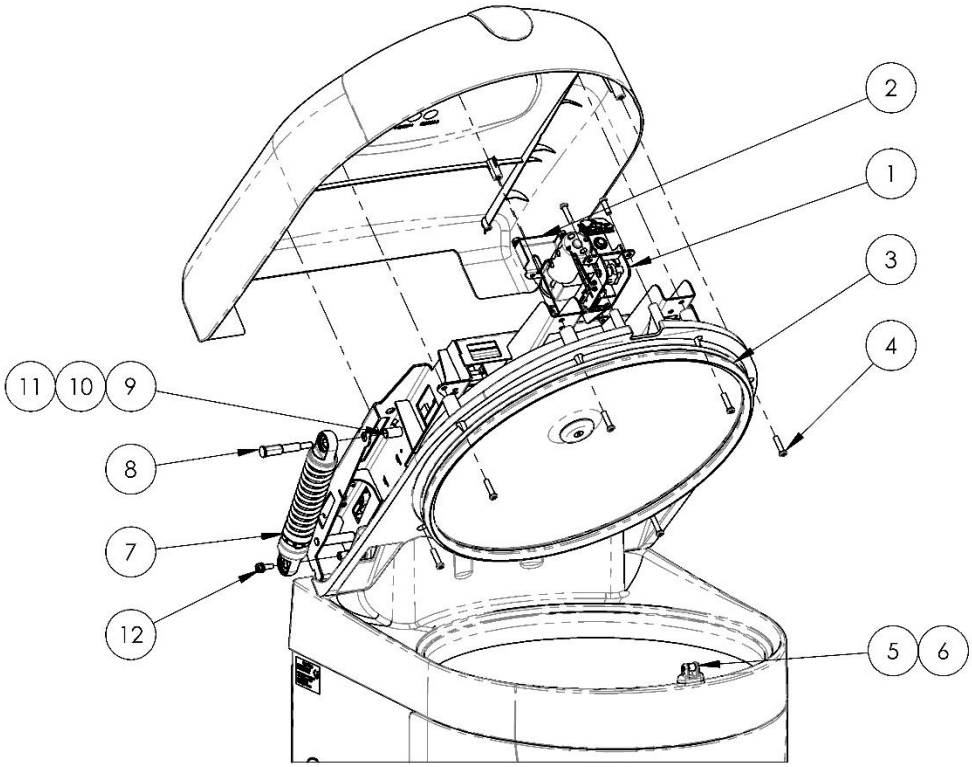
Denotes assembly step

General assembly



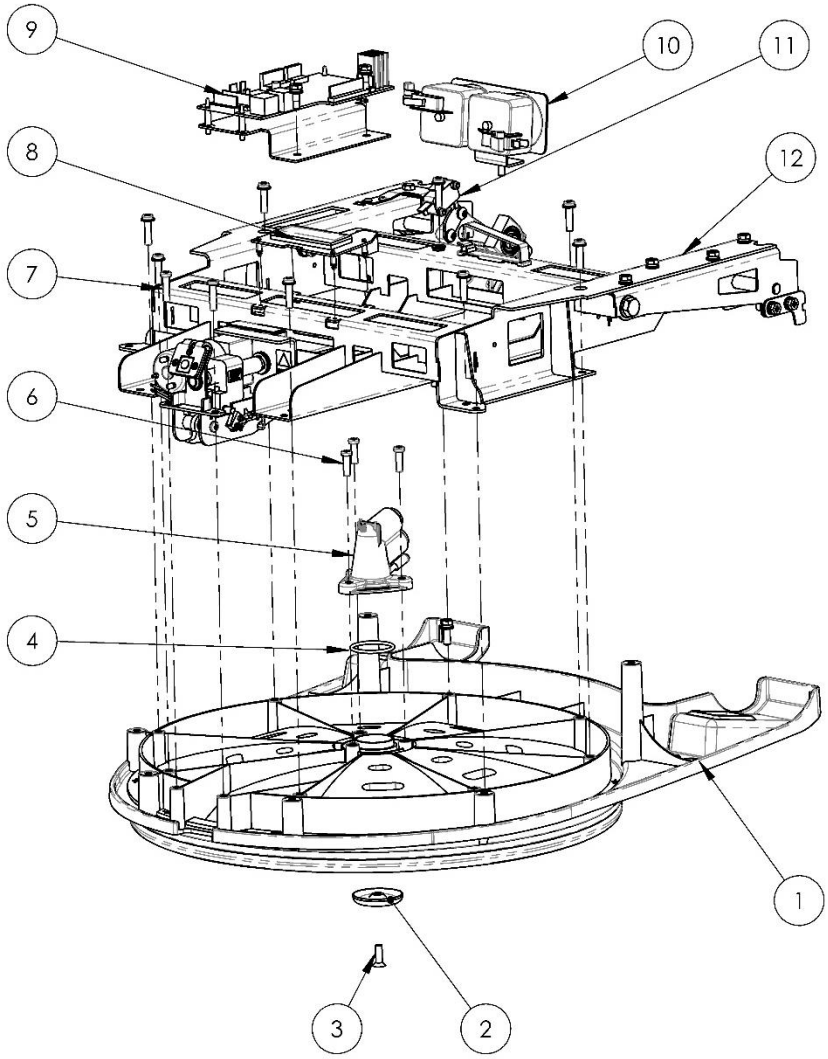
Item	Part number	Description	Qty
1	904-111570	Top Cover Assembly	1
	903-111570	Top Cover Assembly (Auto opening/closing only)	
2	902-111851	Rear Cover Plate Assembly	1
3	904-111569	Lid Assembly	1
4	901-111591	Cabinet Top & Seal Assembly	1
5	901-113188	Hinge Actuator Assembly (Auto opening/closing only)	1
6	901-111580	Cistern	1
7	901-111512	Overflow Fitting	1
8	903-110873	Frame & Top Plate Assembly	1
9	901-113455	Tec care Kit	1
10	901-111598	Plumbing Assembly	1
11	901-113451	Aero-jet Kit	1
12	901-110942	Drain Outlet Assembly	1
13	901-111567	Pulveriser Head Assembly	1
14	901-113409	Foot Pedal Assembly	1
15	910-111503	Single Phase Ctrl Enclosure Assembly	1
	911-111503	Three Phase Ctrl Enclosure Assembly	
16	901-111581	Front Cover Assembly	1
17	910-111848	Single Phase Pump Assembly	1
	911-111848	Three Phase Pump Assembly	
	912-111848	100-120V. Pump Assembly	
	913-111848	220V 60Hz Pump Assembly	
19	904-111566	Single Phase Motor Assembly	1
	905-111566	Three Phase Motor Assembly	
20	901-111598	Plumbing Assembly	1
21	901-111600	Striker Assembly	1
22	902-111576	Fine Maceration Impeller & Hub Cap Assembly	1
23	902-111512	Overflow Fitting	1

Lid (external)



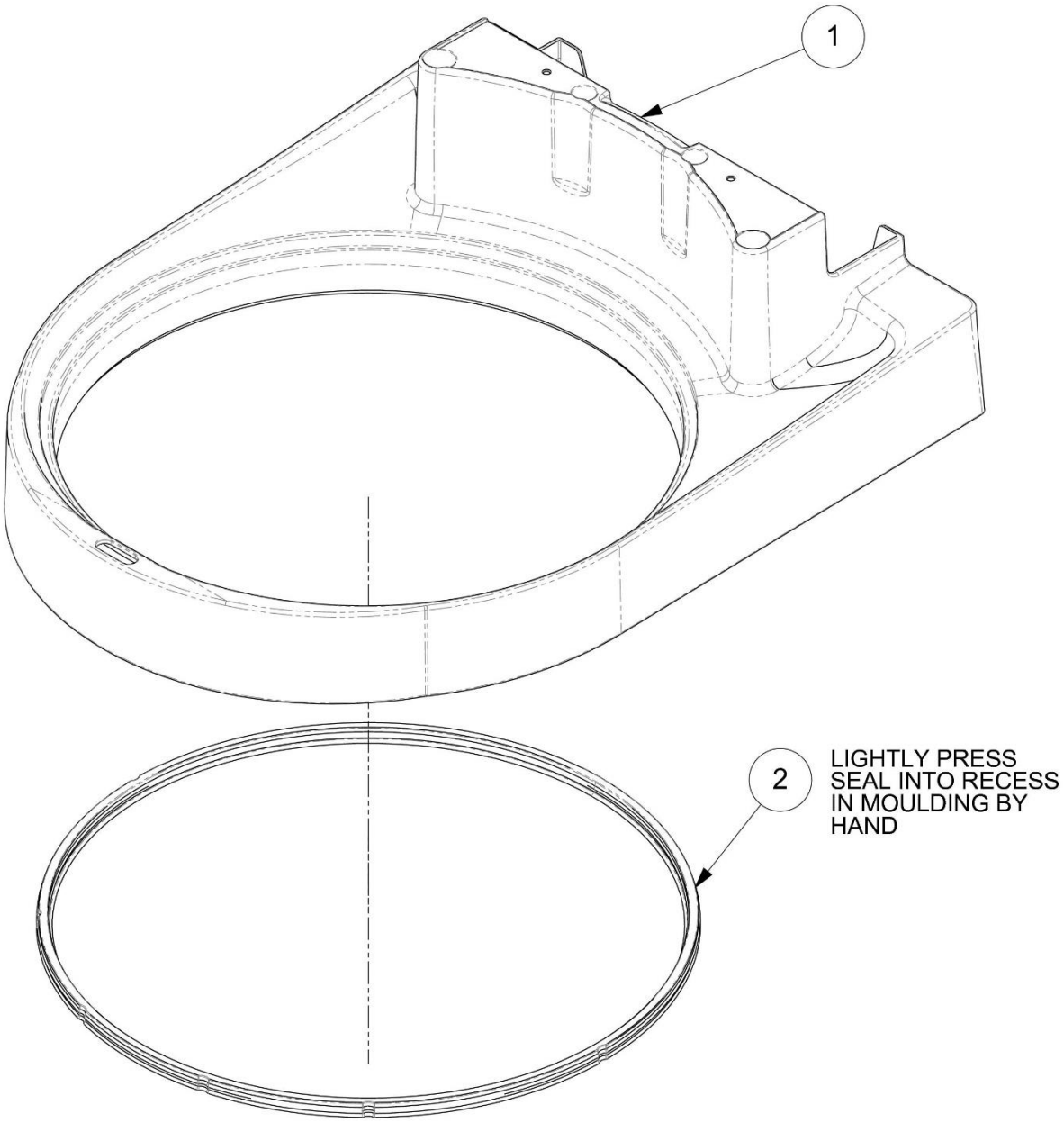
Item	Part number	Description	Qty
1	901-111199 901-113443	Latch Assembly (Manual Closing) Latch Actuator (Auto opening/closing)	1
2	901-113042	Gear Cover (Auto opening/closing only)	
3	901-111587	Lid Seal Assembly	1
4	901-107162	Screw	8
5	901-111600	Striker Assembly	1
6	901-111421	Striker Seal (included with Striker Assembly)	1
7	903-111488 904-111488	Damped Spring Assembly (Manual Closing only) Non-damped Spring Assembly (Auto opening/closing only)	2 1
8	901-111522	Hinge Pin	2
9	901-111523	Hinge Boss	2
10		Washer M6 Plain	2
11		Nut M6 Nyloc	2
12		M5 SEMS Screw	4

Lid (internal)



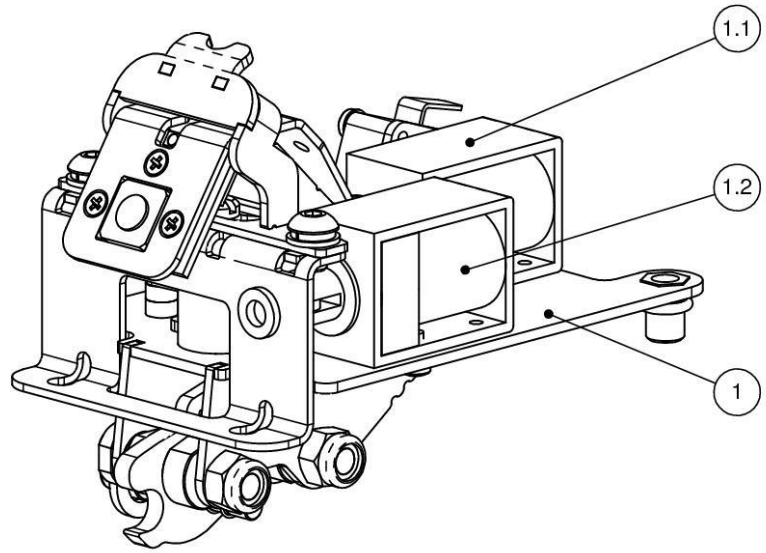
Item	Part number	Description	Qty
1	901-111587	Lid Seal Assembly	1
2	900-013486	Spray Vent	1
3	900-013522	Screw	1
4	997-051206	O Ring	1
5	901-111288	Spray Inlet	1
6	901-107162	Screw M5x16 Pozi Pan	3
7	902-107162	Screw M5x20 Pozi Pan	10
8	902-113211	OLED	1
9	902-111516	PCB	1
10	905-003571	Pressure Switch	1
11	900-003940	Switch	1
12	904-111596	Lid Support (c/w Hinge Bracket and Spring Assembly)	1

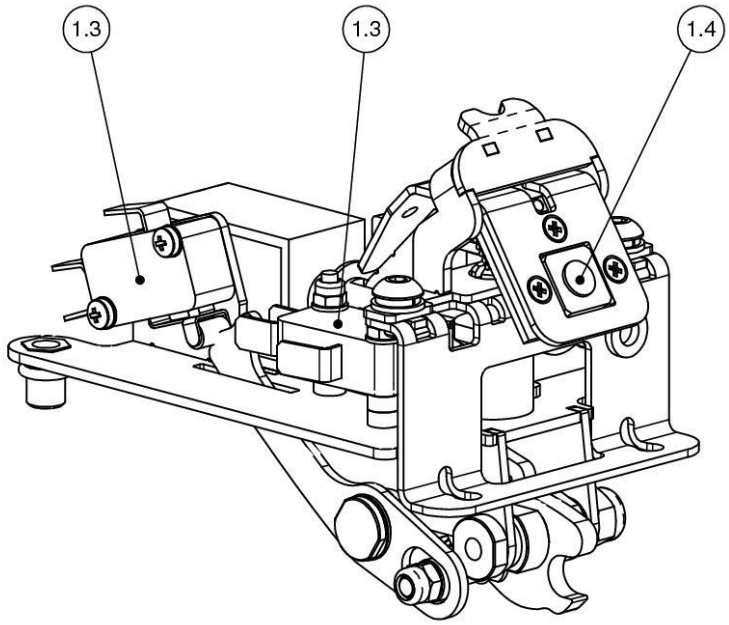
Top assembly of cabinet



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

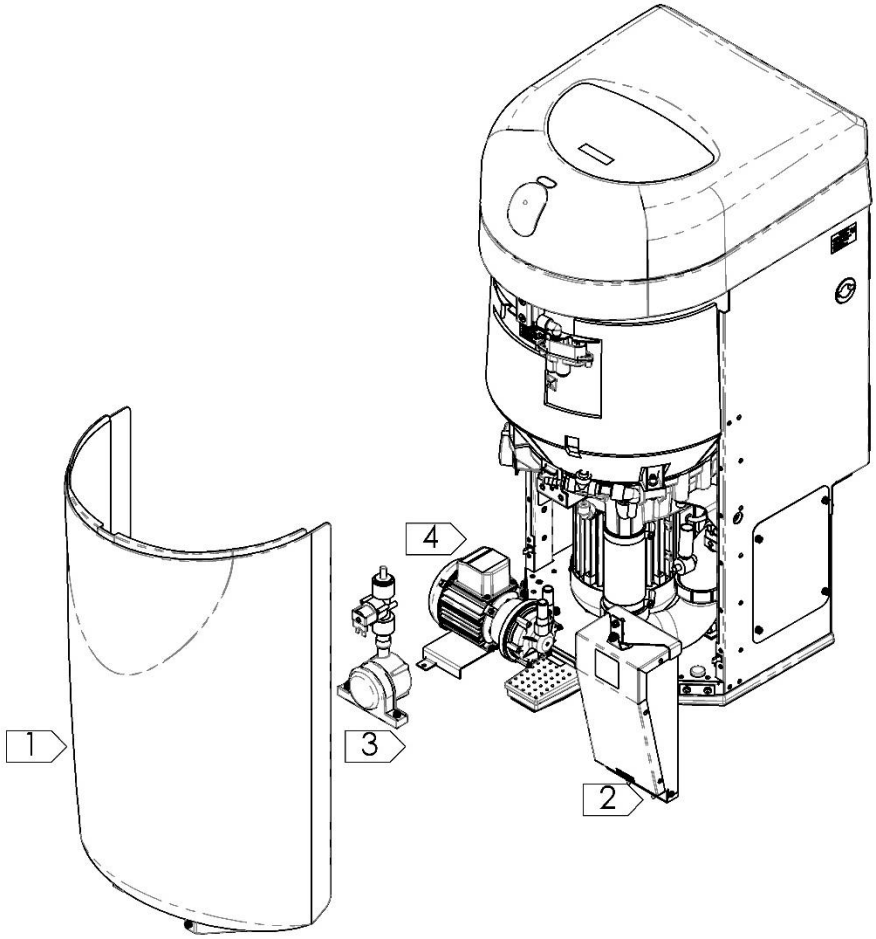
Latch assembly (manual closing only)



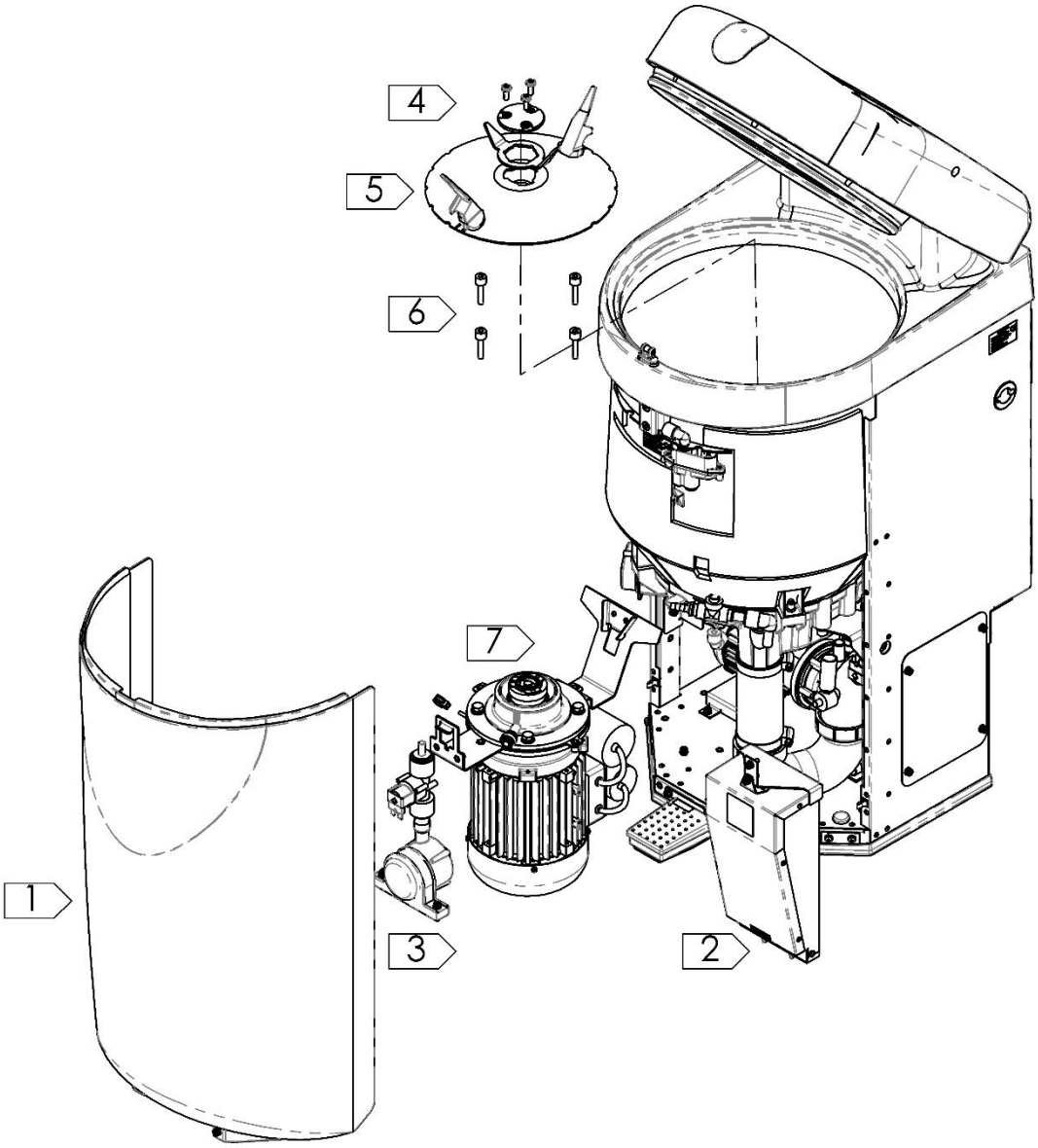


Item	Part number	Description	Qty
1	902-111199	Latch Assembly	1
1.1	902-107552	Solenoid	1
1.2	901-030234	Solenoid	1
1.3	900-030183	Micro Switch	2
1.4	903-111880	Switch PCB	1

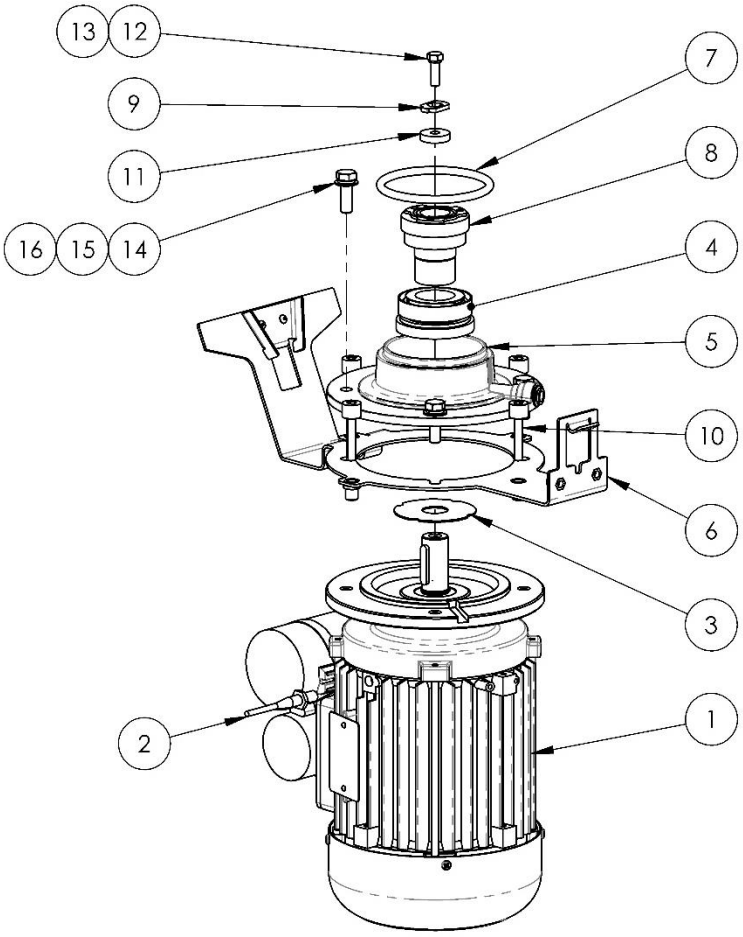
Main pump and aero-jet pump removal diagram



Mechanical assembly diagram

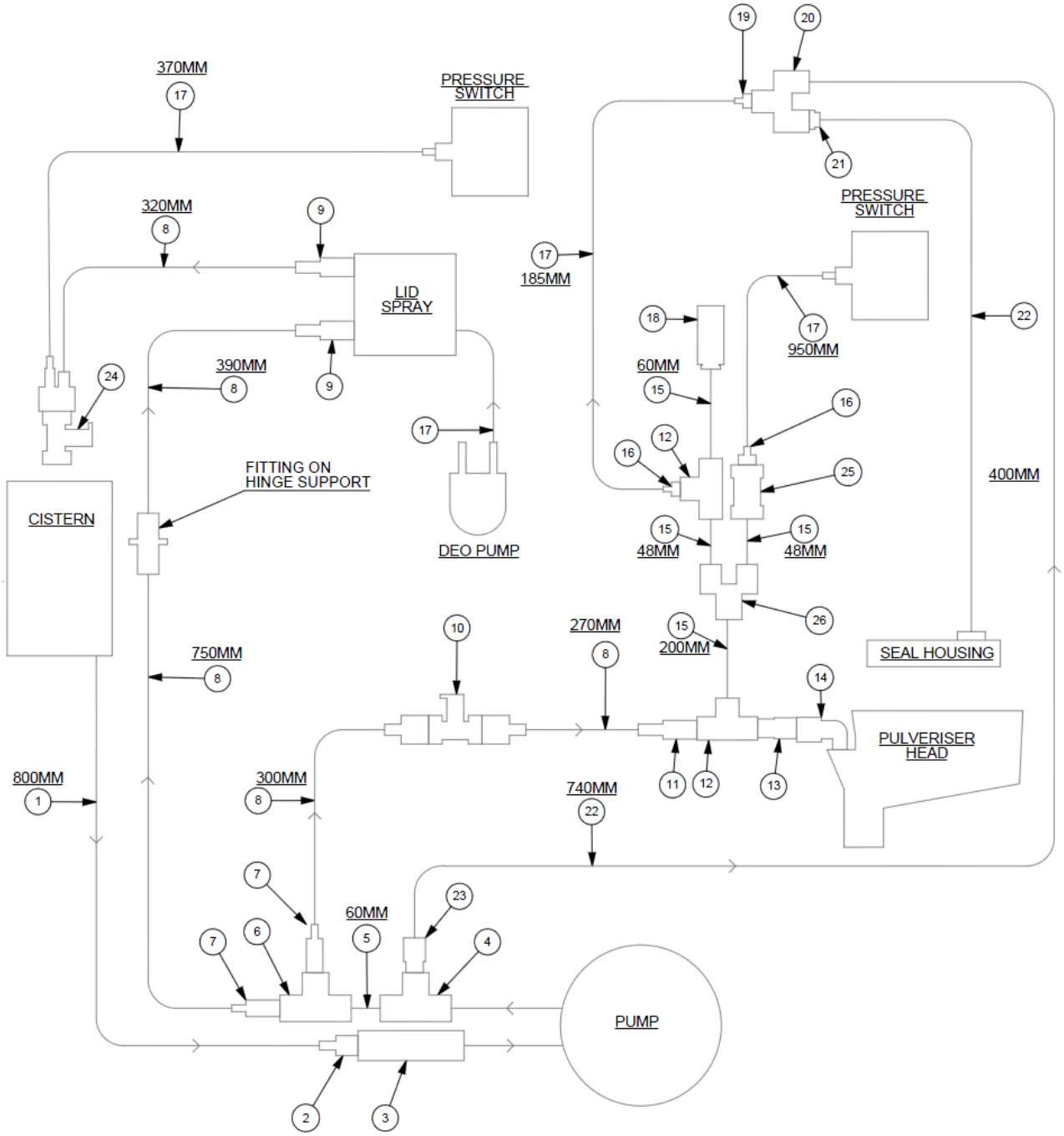


Mechanical assembly servicing diagram



Item	Part number	Description	Qty
1	909-014614	Motor 230V-1-50Hz	1
	904-014615	Motor 400V-3-50Hz	1
	914-014614	Motor 220V-1-60Hz	1
	912-014614	Motor 100V-1-50&60Hz	1
2	901-111578	Speed Sensor	1
3	902-013924	Water Thrower	1
4	901-013926	Mechanical Seal	1
5	901-111573	Seal Housing	1
6	901-111266	Motor Hinge Plate	1
7	955-051206	O Ring	1
8	901-013921	Impeller Hub	1
9	901-013841	Lock Washer	1
10	901-111568	Sealed Screw	4
11	901-013922	Hub Washer	1
12	703-006229	Washer 6mm Spring	1
13	761-006110	Screw M6x20 Hex Hd	1
14	709-006218	Washer 8mm Plain	4
15	704-006229	Washer 8mm Spring	4
16	728-006118	Screw M8x25 Hex Hd	4

Plumbing diagram



Plumbing parts list

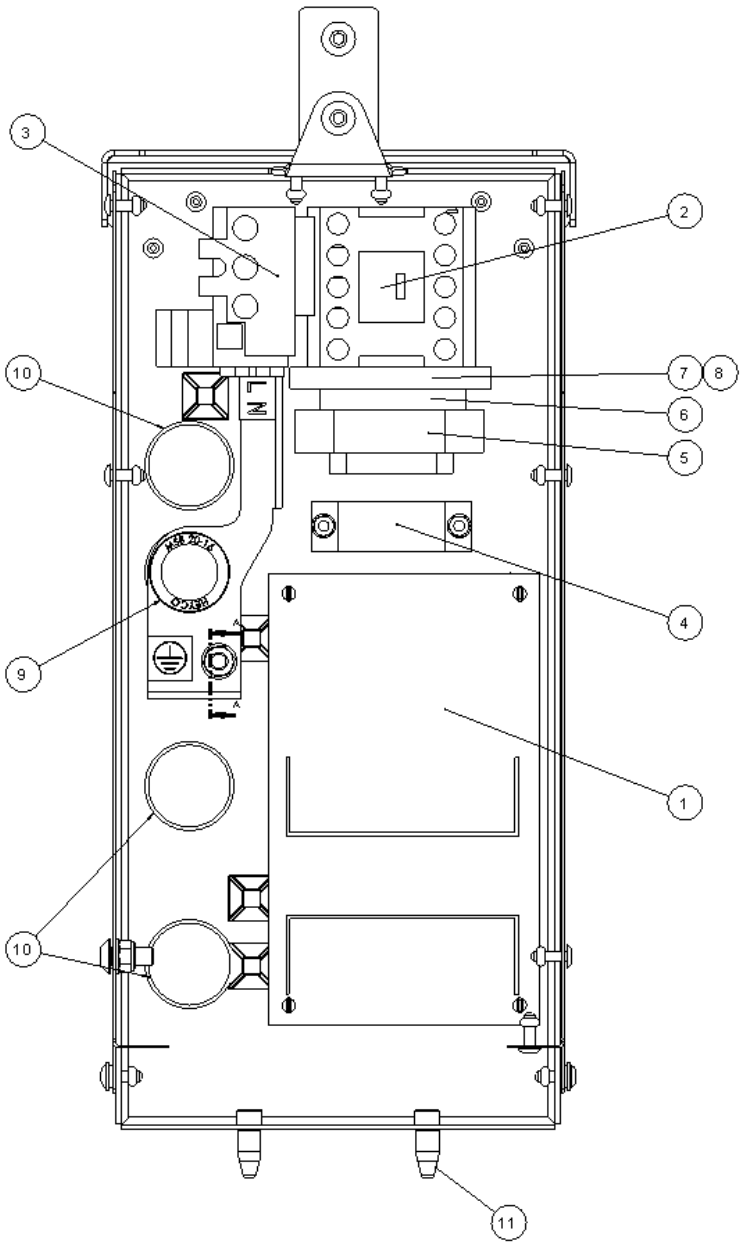
Item	Part number	Description	Qty
1	604-000131	Ø18mm X Ø13mm PVC Braided Hose RPVC12	800mm
2	904-111546	Hose Stub	1
3	901-013998	Service Valve JG 15SV	1
4	901-013958	Reducing T JG PEM3015AW 15-15-10	1
5	624-000139	15mm John Guest LLDPE Tube	60mm
6	900-016938	15mm Equal Tee	1
7	905-111546	Hose Stub	2
8	627-000139	Ø13.5mm X Ø8mm Reinforced PVC Braided Hose	2050mm
9	901-111546	Hose Stub	2
10	901-111631	Drain Flush Solenoid Assembly (BLUE Identifier)	1
11	901-103002	10mm Tube To 8mm Hose Stem JG PM251008E	1
12	901-101313	Tee 10 X 10 X 10 JG PM0210E	1
13	907-111546	Hose Stub	1
14	900-013608	Stem Elbow 12 X 12 JG PM022121E	1
15	625-000139	Ø10mm X Ø8mm Flexible Nylon Tube	250mm
16	903-013527	Adaptor	2
17	608-000131	Tube 3id X 6od Clear PVC	2050mm
18	901-111840	Vent Valve	1
19	902-013527	Adaptor	1
20	901-013613	8mm Divider JG RM2308E	1
21	901-111562	Seal Housing Restrictor	1
22	628-000139	Tube 8 X 5,5 JG PE-0806-100M-N	1350mm
23	902-013945	10mm x 8mm Reducer JG: PM061008E	1
24	902-111626	HPR Solenoid Assembly	1
25	901-013774	10mm Equal Straight Adaptor JG: PM0410E	1
26	902-013613	10mm Divider JG: RM2310E	1

Note:

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

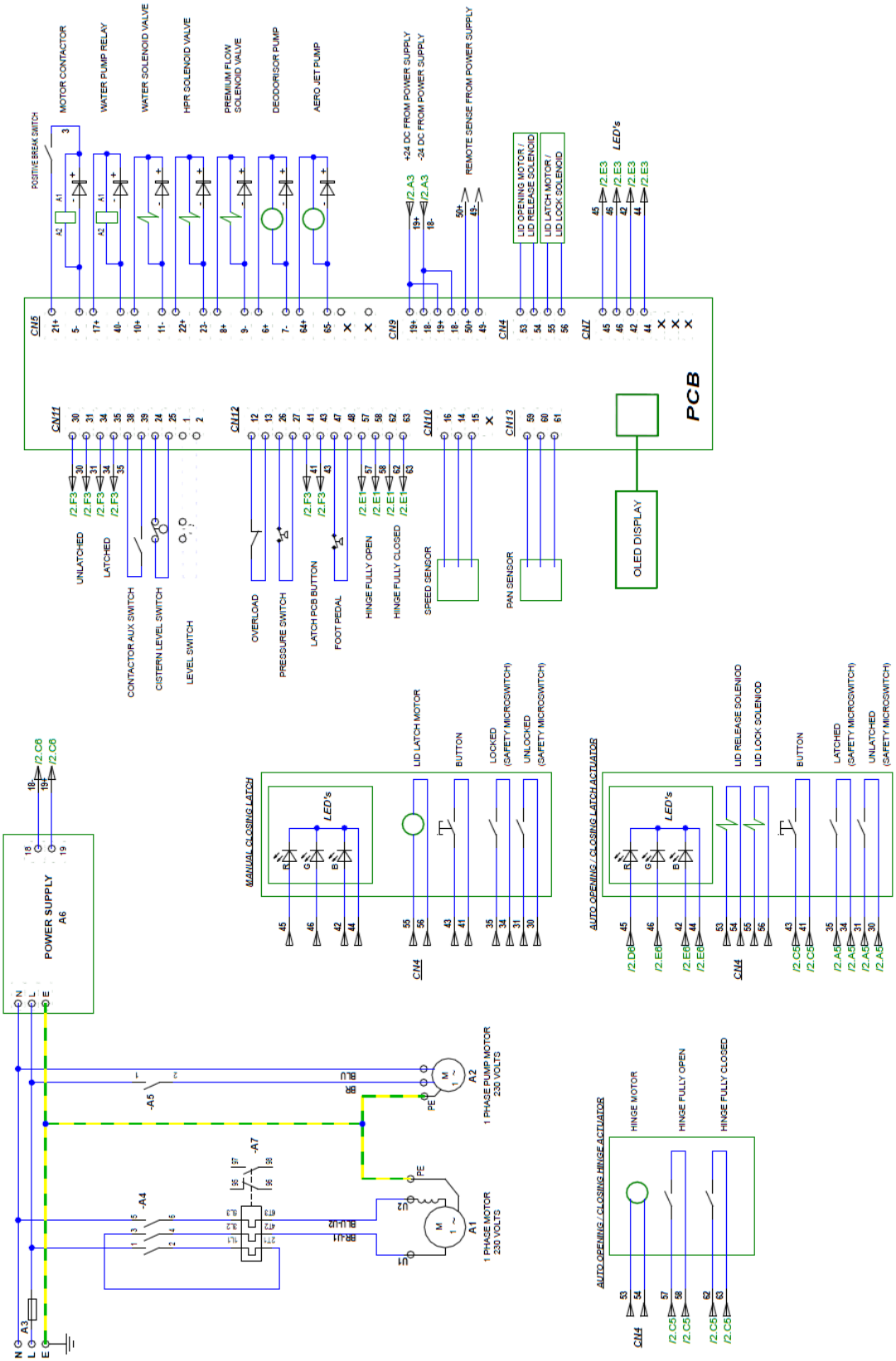
Hose part number	Jubilee clip size	Part number	Quantity
604-000131	00	703-006082	2
627-000139	M00	900-005293	10

Control enclosure

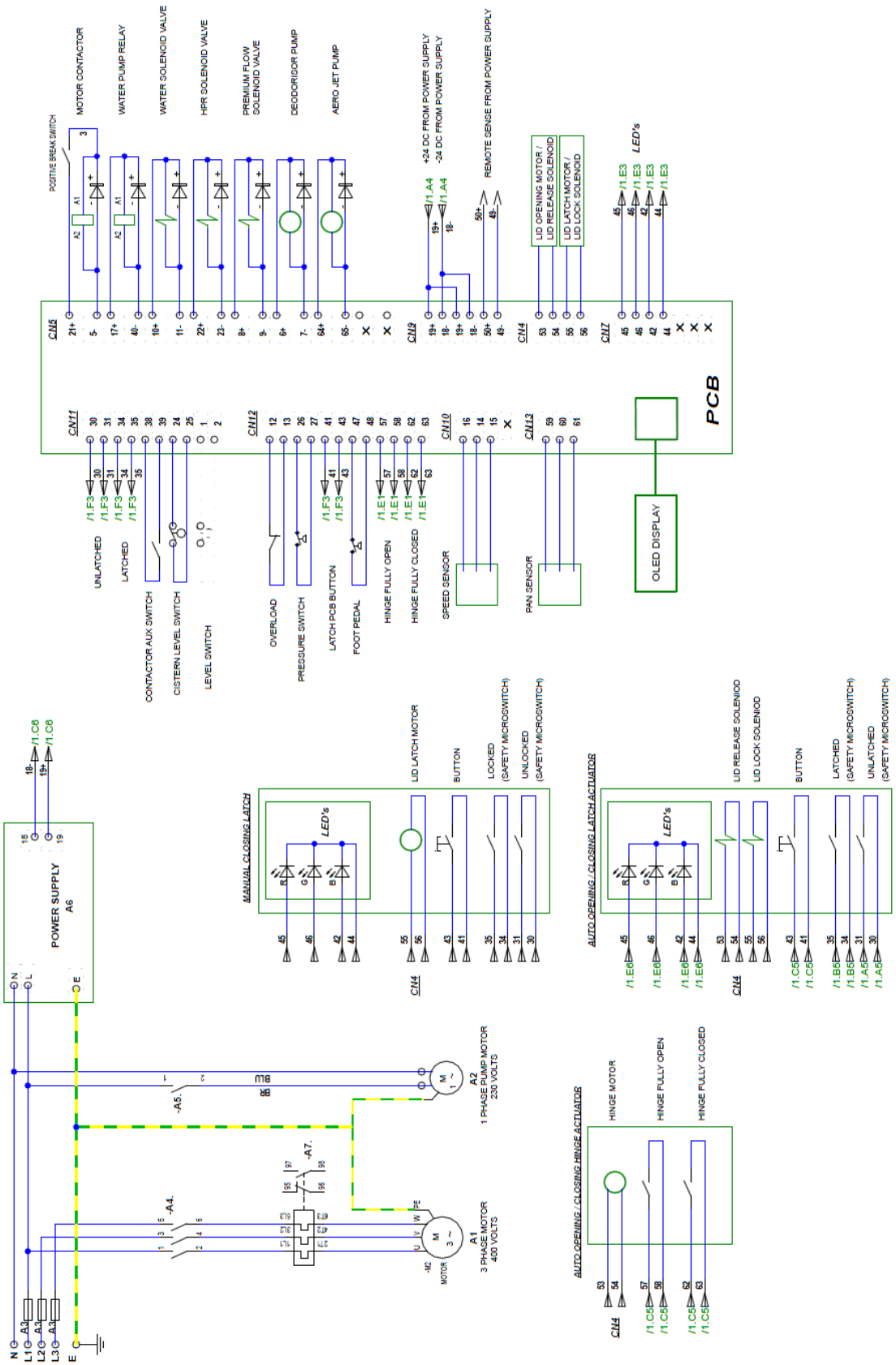


Item	Part number	Tag #	Description	1 ph.	3 ph.
1	901-111557	A6	Power Supply	1	1
2	900-030209	A4	Contactor	1	1
3	902-030154	A7	Overload Device 4.0-6.2A	1	-
	904-030154		Overload Device 1.2-1.9A	-	1
4	106-031088	A5	Relay	1	1
5	129-031012	-	End Stop	1	-
6	100-031012	-	Grey Terminal	1	1
7	125-031012	-	Fused Terminal	1	3
8	111-031099	A3	FUSE 10A HBC 20mm X 5mm Dia	1	-
	112-031099		FUSE 6.3A LBC 20mm X 5mm Dia	-	1
9	108-031131	-	Snap Bush	1	1
10	902-111517	-	Grommet	4	4
11	901-016583	-	Location Peg	2	2

Wiring diagram – single phase



Wiring diagram – 3 phase



Control gear

Tag	Part number	Description	Function
A1	n/a	Motor	
A2	901-100226*	Pump*	
A3	125-031012	Mains Fuse 10A (1Φ)	
		Mains Fuse 10A (3Φ)	
A4	900-030209	Contactor	Motor control
A5	106-031088	Relay	Control water pump
A6	901-111557	Power Supply	Supply 24V DC output
A7	902-030154	Overload Device 4.0-6.2A	Motor control
	904-030154	Overload Device 1.2-1.9A	
B1	901-111630	Solenoid Valve Kit	Mains water supply
PCB	901-111516	PCB	Logic Control
B2	901-111605*	Solenoid Valve (RED Identifier)*	HPR
B3	901-103786*	Solenoid Valve (BLUE Identifier)*	Premium Flow
B4	901-030234	Solenoid (latching)	Lid Lock
B5	902-107552	Solenoid	Lid Release
B6	901-111812*	Pump*	Deodoriser
C1	900-030183	Micro-switch	Safety monitoring
C2	900-030183	Micro-switch	Safety monitoring
C3	900-003940	Positive Break switch	Break contactor coil connection
C4	902-102108*	Level switch*	Low water level indication
C5	902-102108*	Level switch*	Low deo level indication
C6	905-003571*	Pressure switch*	System pressure sensing
C7	n/a	Soft Touch Button	Signal to operate lid solenoid
C8	n/a	IR sensor	Signal to indicate load sensing
C9	901-111578	Speed sensor	Signal to indicate motor turning
C10	n/a	LED	TBA
C11	901-112530	Buzzer	Audible feedback regarding machine operation
C12	n/a	Foot Pedal Switch	Lid Opening
D1	901-111571	LCD	Visual feedback regarding machine operation

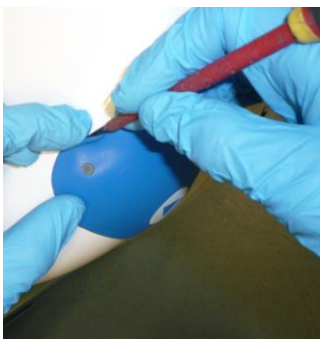
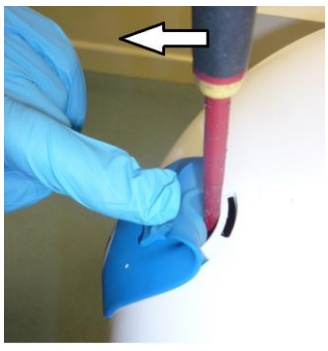
*Denotes component less fixing brackets

8. Fault finding

Electrically isolate the machine before any maintenance

Maintenance should only be performed by qualified personnel

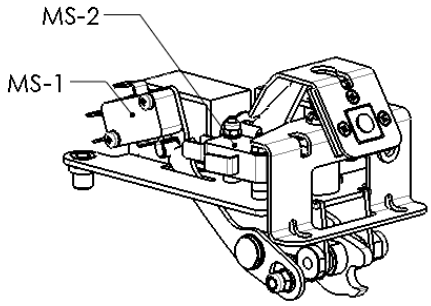
Always check the indicator lights on the machine before calling maintenance staff, as simple remedies may work.

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. A solenoid on the latch mechanism locks the lid. The lid cannot be opened until: 1. The power is restored. 2. The interlock latch is released manually.   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
F1 (manual close only)	Latch not engaged after three attempts: • Lid latch not correctly fastened. • Note - Occurs after three failed attempts to latch the lid closed. Make sure that the lid interlock is correctly adjusted, adjusted if required.

F2
 	
(manual close only)
	Safety monitor circuit malfunction:
	• Interlock micro switch circuit broken during machine operation
	• Remove lid cover:
	  • Check micro switch (MS-1 and MS-2) operation
	  • Check MS-1 and MS-2 circuits for continuity.
	 

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 	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 (Hands-free models only)	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 (Hands-free models only)	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.
	No indicators illuminated: • Power failure • No power to machine. • Check indicator membrane is connected properly. • Check fuses / electrical connections.

9. EC Declaration of Conformity

EC Declaration of Conformity

In accordance with EN ISO 17050-1:2010

Object of the declaration:

Product:	Pulp Disposal Unit
Model/type:	Quattro
Serial nos:	2017A-1-230-1001 onwards, 2017A-3-400-1001 onwards, 2017A-1-220-1001 onwards, 2017A-1-100-1001 onwards
Manufacturer:	The Haigh Engineering Company Limited
Address:	Alton Road, Ross-on-Wye, HR9 5NG, UK

This declaration is issued under the sole responsibility of the manufacturer.

The object of the declaration described above is in conformity with the relevant Union harmonisation legislation:

2006/43/EC	The Machinery Safety Directive
2014/108/EU	The Electromagnetic Compatibility Directive
2014/35/EU	Low Voltage Directive
2011/65/EU	Restriction of Hazardous Substances Directive

Conformity is shown by compliance with the applicable requirements of the following standards:

EN ISO 12100:2010	*Safety of machinery - General principles for design – Risk assessment and risk reduction*
EN 55014-1:2006 + A1:2009 + A2:2011	*Electromagnetic compatibility : Emissions*
EN 55014-2:2015	*Electromagnetic compatibility : Immunity*

Signed for and on behalf of:	The Haigh Engineering Company Ltd
Date of Issue:	June 2017
Name:	Stuart Anderson
Position:	Managing Director
Signature:	

10. Warranty

The standard warranty is for three years. There is an option to extend the warranty to a total of six years.

Our warranty provides a guarantee against defects in manufacture for the period of warranty from the purchase date within the UK mainland and Northern Ireland. An extended warranty or service contract is available by contacting our sales office.

Damage caused by misuse is chargeable and will invalidate the warranty, as will poor installation, if the machine is not installed in accordance with the installation instructions as detailed in this manual.

This warranty does not affect your statutory rights.

If you need to contact us regarding your warranty, please quote the serial number of the machine concerned. This can be found on a label each side of the machine (1 and 2) and on the hopper front when the cover has been removed (3).

Our contact details are:

Sales

+44 (0)1989 760 200

info@haigh.co.uk

Service

+44 (0)1989 760 230

service@haigh.co.uk