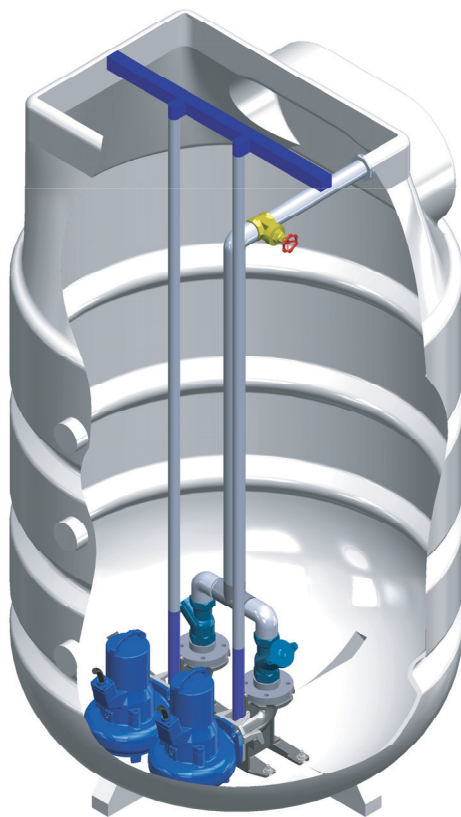


DUTYPOINT **SETTING THE BAR**

Vertical Polyethylene Packaged Pump Stations



Operation and Maintenance Manual

DOC-T10T16OM1801



About us.

Applied knowledge.
Shared know-how.
Fearless innovation.

Together, we are Dutypoint. Since 1976, we've been building up industry-defining expertise in fluid technology.

This knowledge means we solve complex challenges with straightforward solutions that are built around meeting and exceeding our clients' needs. We approach everything with the same philosophy: how will we go above and beyond?

Our commitment to collaboration and sharing knowledge galvanises and cements robust relationships. Relationships that are built to last, because our clients are our partners.

Our focus for the future? Innovation. We want to be the future of our industry, globally. Where we benchmark thought leadership, expertise and customer care.

We set the bar.

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1. Important Safety Information

1.1 Health & Safety at Work Act 1974

Section 6(a) of this Act requires manufacturers to advise their customers on the safety and the handling precautions to be observed when installing, operating, maintaining and servicing their products. The user's attention is therefore drawn to the following:

- The appropriate sections of this manual must be read before working on the equipment.
- Installation, operating and maintenance must only be carried out by suitably trained/qualified personnel.
- Normal safety precautions must be taken and appropriate procedures observed to avoid accidents.

Refer to Dutypoint for any technical advice or product information. It is the responsibility of the customer and/or the contractor:

- To ensure that anyone working on the equipment is wearing all necessary protective gear/clothing;
- Is aware of appropriate health & safety warnings and to read the information in this manual.

1.2 Safety Messages and Hazard Statement

Table 1.1: Hazard Notice Definitions

Message Level	Definition
DANGER	A hazardous situation which, if not avoided, will result in death or serious injury
WARNING	A hazardous situation which, if not avoided, could result in death or serious injury
CAUTION	A hazardous situation which, if not avoided, could result in minor injury or moderate injury
ELECTRICAL HAZARD	Risks associated with electricity will cause hazards if not properly avoided
Note	A situation which may arise resulting in undesirable conditions and/or will not cause direct hazards to persons

1.3 Qualified Personnel

WARNING

This product is intended for operation by qualified personnel only

- Only qualified personnel are allowed to install or operate this equipment
- Qualified personnel are defined as trained staff, who are authorised to install, commission and maintain equipment, systems and circuits in accordance with relevant laws and regulations. Personnel must be familiar with the instructions and safety procedures described in this document.
- This product should not be used by anyone with mental disabilities, or anyone without the relevant experience and knowledge, unless they have received instructions on using the equipment and on the associated risks, or are supervised by a responsible person.
- Children must be supervised to ensure they do not play on or around the equipment.

1.4 Environmental Protection

All local regulations and codes regarding emissions and waste disposal must be followed. This may include:

- Reporting of emissions to appropriate authorities

- Sorting, recycling and disposal of solid or liquid waste
- Clean-up of spills
- Separate disposal of electrical components from domestic waste

1.5 Mechanical Device Servicing

- Familiarise yourself with the relevant contents of this manual
- Installation, maintenance and repair work must only be carried out by trained, skilled and suitably qualified personnel.
- Disconnect or lock-out the power source to ensure that the item(s) will remain inoperative. Locking out the equipment by switching off the release mechanism or set value WILL NOT prevent accidental starting.
- Allow the item(s) to cool if over-heated.
- CLOSE the isolating valves on the suction and discharge connections of the affected item(s).
- If working on pump, VENT slowly and cautiously – Refer to the relevant section of this manual.
- DRAIN the pump(s).

1.6 Pump Hand Control Mode (Where Fitted)

In the 'HAND' position the pump(s) controlled by the switch will normally run at full speed and completely independently of any control devices, and can result in pump(s) running against a closed valve head if there is no draw. This can cause the system to be maintained at the maximum pressure produced by the pump plus any incoming pressure and additional pressure caused by water surge and can potentially damage the pump and other parts of the system.

The 'HAND' option should only be used with a competent operator in attendance, or when there is a continued demand sufficient to provide constant flow through the pumps to maintain the running pressure of the system to an acceptable level.

1.7 Personal Protective Equipment

Use personal safety equipment according to the site conditions and employer regulations. This may include, but may not be limited to:

- Hard hat
- Safety goggles with side shields
- Protective footwear
- Protective gloves
- Respirator
- Ear protection
- First aid kit
- Safety devices

1.8 Precautions Before Commencing Work

Ensure that the following safety precautions are complied with before commencing work:

- Provide a suitable barrier around the work area
- Ensure all safety guards are in place and secure
- Ensure you have a clear path of exit
- Ensure that the product cannot roll or fall over and cause damage to persons or property
- Ensure all lifting equipment is in good condition and rated for the intended task
- Use a lifting harness, safety line and respirator as required
- Allow hot components to cool before handling them
- Ensure that product has been thoroughly cleaned
- Disconnect and lock out power supply, ensuring that it cannot be accidentally re-connected

- Check for any risk of explosion before using hand tools

1.9 Precautions During Work

- Never work alone
- Always wear protective clothing and hand protection
- Stay clear of suspended loads
- Always use appropriate lifting devices
- Beware of risks of sudden starts of any automated equipment such as level control
- Beware of starting jerks of electric motors - these can be powerful
- Do not exceed the stated operating limits of equipment
- Do not remove vent plugs from a pressurised system - ensure pressurised components are relieved of pressure before disassembly
- Ensure guards are in place during operation

1.10 Hazardous Fluids and Chemicals

If hazardous chemicals come into contact with skin or eyes, use the following procedures:

Condition	Action
Chemicals or hazardous fluids in eyes	1) Hold your eyelids apart forcibly with your fingers 2) Rinse the eyes with eyewash or running water for at least 15 minutes 3) Seek medical attention
Chemicals or hazardous fluids on skin	1) Remove contaminated clothing 2) Wash the skin with soap and water for at least 1 minute 3) Seek medical attention

1.11 Electrical Safety - High Voltages

This information is especially applicable when Variable Speed Controllers (Inverters) are fitted to pumps.

When the inverter variable speed drive head is connected to the power supply the components of the power unit as well as certain components of the master control unit – are also connected to the power supply.

DANGER!

Touching these components can seriously endanger life!

- Before removing the frequency inverter cover, the system must be disconnected from the power supply
- After switching off the power supply wait at least 5 minutes before starting work on or in the inverter drive head - the capacitors in the intermediate circuit must be given time to discharge completely via the discharge resistors.

ELECTRICAL HAZARD

Up to 800V can be present - if there are faults this can be higher

- All work carried out when the frequency inverter is open must be performed only by suitably qualified and properly authorised personnel.

ELECTRICAL HAZARD

THE SYSTEM MUST ONLY BE OPERATED WHEN IT HAS BEEN CORRECTLY EARTHED AND PIPES BONDED TO EARTH IN ACCORDANCE WITH IEE REGULATIONS

- When connecting external control wires care must be taken not to short circuit adjacent components. Bare cable ends which are not in use must be insulated.
-

1.12 Electronic Safety Devices

- Inverter drives contain electronic safety devices which switch off the control element in the event of a fault developing.
 - A motor can also be stopped by 'mechanical blocking'
 - If it is switched off electronically, the motor is disconnected from the mains voltage supply via the electronics in the inverter drive.
 - Voltage fluctuation and power failures (temporary outages) can cause the motor to switch itself off.
-

WARNING

A motor will have zero current but will remain energised as it stops

- Take necessary precautions - the motor is not voltage-free in the circuit itself
-

WARNING

Repair of faults can cause items to start up again unexpectedly

- Ensure the motor is isolated before commencing any work
-

WARNING

High voltage tests of inverters may damage the electrical components.

- Bridge before the incoming/outgoing terminals L-L2-L3 and U-V-W.
 - To avoid incorrect metering by capacitors incorporated in the electronic circuits, isolate the motor from the inverter drive head.
-

1.13 Spare Parts

WARNING

Use of non-genuine spare parts may cause damage to equipment, damage to property and voiding of warranty

- Use genuine, Dutypoint-approved spare parts only
 - If in doubt, contact Dutypoint Service on 01452 300590.
-

1.14 Transportation and Lifting

WARNING: LIFTING HAZARDS

- Stay clear of suspended loads
 - Observe accident prevention regulations in force
 - Do not damage the cables during transports; so not squeeze, bend or dray the cable
 - Always keeps the cable ends dry
 - Secure the unit against tipping over and slipping until it is mounted and fixed in its final location
 - Lift and handle the product carefully, using suitable lifting equipment (stacker, crane, crane mounting device, lifting blocks, sling ropes, etc.)
 - Always lift the unit by its lifting handle
-

WARNING: ASSEMBLED SYSTEMS ARE HEAVY

- Failure to properly lift and support this equipment can result in serious physical injury and/or equipment damage,
 - Lift equipment only at the specifically identified lifting points.
 - Lifting devices such as eye bolts, slings and spreaders must be rated, selected and used for the entire load being lifted
 - Select the appropriate lifting points
-

- 1) Inspect the package
 - a) Inspect the package for damage or missing items upon delivery
 - b) Note any damaged or missing items on the shipping paperwork and contact Dutypoint immediately
 - c) File a claim with the shipping company if anything is out of order
 - d) If the product has been picked up at a distributor, file a claim with the distributor
- 2) Inspect the unit
 - a) Remove packing materials from the product
 - b) Dispose of all packing materials in accordance with local regulations
 - c) Inspect the product to determine if any parts have been damaged or are missing
 - d) If applicable, unfasten the product by removing any screw, bolts or straps. For your personal safety, be careful when you handle nails and straps.
 - e) Contact Dutypoint if you have any issues.

1.15 Storage

The product must be stored in a covered and dry location free from heat, dirt and vibrations.

NOTE: Protect the product against humidity, heat sources and mechanical damage

NOTE: Do not place heavy weights on the packed product

NOTE: See section on storage limits

1.16 Disposal

At the end of its working life, this product should not be disposed of with standard household waste, but rather dropped off at a collection point for the disposal of Waste Electrical and Electronic Equipment (WEEE) for recycling.

Figure 1.1: Waste Symbol

This is confirmed by the [Waste Symbol](#) found on the product, user manual or packaging.

Depending on their characteristics the materials may be recycled. Through recycling and other forms of processing Waste Electrical and Electronic Equipment, you can make a significant contribution towards helping to protect the environment.

Please contact your local authorities for information on the collection point nearest you.

2. Waste Water Safety

The following information is extracted from HSE publication ND (G) 84L/2-90/70L

SEWAGE GASES ARE EXPLOSIVE AND TOXIC. THE EQUIPMENT AND THE AREA IMMEDIATELY SURROUNDING IT SHOULD BE SUBJECT TO THE FOLLOWING SAFETY PRECAUTIONS:

- NO SMOKING
 - No naked flames or sparks
 - Only qualified people may carry out maintenance / service work on the plant
 - Nobody may enter the sump until the atmosphere is checked for safety by means of a suitable portable gas detector
 - Nobody may enter the sump until the equipment is switched off/isolated electrically - and padlocked in the OFF position
 - Temporary barriers and warning signs must be erected around all open access covers
-

2.1 Leptospirosis: a risk that must not be ignored

Leptospirosis takes two forms in the UK: Weil's Disease, which is transmitted by contact with the urine of infected rats, and Hardjo Leptospirosis, which is transmitted from cattle. As well as people whose jobs involve close contact with animals or carcasses - e.g.: Farmers, Vets, Meat Inspectors, Butchers, Abattoir workers etc., anyone who is in contact with sewage, river or canal water is at risk.

Infection can often be as a result of the bacteria entering the body via cuts or skin abrasions or through the mouth, throat or eyes after contact with an infected liquid.

Symptoms of both forms are similar to influenza with a severe headache.

To prevent infection, use waterproof plasters on all cuts and skin abrasions and wear protective clothing. Wash thoroughly after handling any sewage or equipment in contact with sewage, and always do so before eating, drinking or smoking.

Report any illness to your doctor and inform him/her of your work - see medical information below. The effects of Leptospirosis can be much less severe if treated promptly.

2.2 Note for the Doctor

This patient's work may expose him/her to the danger of Leptospirosis (either *L.icterohaemorrhagiae* or *L.hardjo*). Early diagnosis and treatment are vital in Weil's Disease as jaundice is often absent in the early stages. The illness in *L.hardjo* may be greatly shortened by appropriate antibiotic treatment. Your local Public Health Laboratory Service or Hospital Consultant Microbiologist should be able to offer advice and serological testing.

2.3 Further Information

You or your doctor can obtain further information from the Employment Medical Advisory Service at any office of the Health & Safety Executive.

3. Installation

3.1 Pre-Installation Checks

WARNING

Incorrect installation could cause injury or illness to persons and damage to property

- Installation should be carried out by experienced and qualified persons
- Before digging, contact any relevant authorities and study site plans to locate any underground lines or cables
- If this installation of a pump station requires the prior approval of local authorities, questions relating to this should be directed to a responsible officer of the local council and/or other relevant authorities. Dutypoint are unable to supply this information

The following must be considered a guide only and is to be read in conjunction with project-specific documentation.

- 1) Determine the best location for your tank and control panel (if applicable).
- 2) Correct appraisal of site conditions is essential before installation of sewage and storm water tanks. Installers must recognise that whilst many sizes have a greater mass than the water they displace, other tank sizes can be affected by high water table conditions. Should the up-thrust exceed the station dry weight, concrete ballast should be poured around the base of the tank. Please consider:
 - Drainage at the tank base
 - Tidal conditions which may cause rise in water level
 - Saturation of ground during heavy rain
 - Likelihood of flooding or run-off water from any source
 - The quality of available backfill
 - Where tanks are installed under adverse site conditions, the utmost care is required to prevent any chance of the vessel being forced out of the ground by the upward pressure of the water. This can occur if the base is not properly drained.
 - For installations where the water table is above the base of the tank, it recommended that the tanks be bedded on the cement slurry (see installation procedure). This will prevent the base of the tank buckling.
 - Do not install a Vortech tank where water table/groundwater exceeds 2m above the base of the tank - refer to Dutypoint Technical if this is required.
- 3) Check for any damage to tanks. During transport and handling over rough ground, be careful to avoid “bruising”. Contact with solid surfaces, lifting accessories or dropping of the tank may result in damage to the concrete surface, which must be repaired before installation. Refer to supplier.
- 4) Minimise the use of elbows on the inlet line. If required, use only 45 degree elbows.
- 5) Determine where the incoming power will be supplied from and if it can handle the rated load for your pump station.
- 6) Mount the control panel, when applicable, in accordance with electrical codes and where the alarm light can be easily seen.
- 7) Make sure you have all the necessary equipment and supplies before starting your installation.
- 8) Determine the length of electrical cable required as all the joints in cables must be made by approved submersible splice. Only extend cables with cable of equal or greater submersion rating and current carrying capacity. Note: all pumps and float switches are supplied as standard with 10m of cable. For cable lengths required over 30m, please refer to Dutypoint technical department.
- 9) Finish ground level in relation to tank lid, as tank lid risers are not normally recommended. Also, the lid must not be buried at any time.

NOTE: Plan your installation location carefully to ensure that the inlet pipe stays within the allowable inlet height.

3.2 Tank Installation

Dutypoint polyethylene waste water tanks are manufactured in 8-10mm polyethylene in accordance with strict quality control procedures.

Check the depth (invert) of the inlet pipe as this will determine the excavation depth see tank inlet specification. In any case the minimum height from the bottom of the tank to the underside of the inlet pipe must be 600mm

The minimum size of the excavation hole should be 300mm (12") more than that of the tank.

- 1) Lay a minimum of 100mm (4") of 20mpa concrete in the bottom of the excavation hole if there is no potential water ingress or flooding problem.
- 2) Whilst the base cement or concrete is still slurry and using suitable lifting equipment - lower the Pumping Station gently onto the base, ensuring that no stones or other sharp objects are allowed to fall in at the same time, or damage to the tank may result.
- 3) Once the tank is roughly in place, check for level and position, and adjust / prop as necessary before leaving it for the slurry to set, ensuring that the top of the excavation is covered with a tarpaulin or suitable PE sheeting to protect it from rain or wildlife.
- 4) Fill the tank with water up to and over the first rib - or in any case, at least 500 - 600mm in depth.
- 5) Ensuring the tank is secure on its base and will not move laterally, pour concrete up to at least the level of the first reinforcing rib on the tank. See note to Step 7 below.
- 6) Make all pipework connections for inlet and discharge pipework. Note that the pump chamber should be vented from one of the 110mm spigot pipe connections below the access cover. A 110mm cable duct is required between the pump chamber and the control panel location and should be connected to one of the 110mm spigot pipe connections just below the manhole cover. A draw cord should be installed and secured in the duct during installation. Check that the pipework connections to and from the tank are secure and leak free, and ensure that all unused connections are plugged and properly sealed.
- 7) NOTE: Local regulations and site conditions will determine whether concrete should be used further up than the first rib, or simply a suitable backfill material (e.g. sand or pea-shingle which will compact easily). It is recommended that no backfilling is undertaken until formal approval of the installation has been obtained from the Building Inspector.
- 8) When surrounding the tank in concrete, ensure water level in tank is higher than the level of concrete outside the tank to prevent buoyancy.
- 9) Finish around the tank top at ground level, ensuring the area is adequately protected from access by vehicles or wildlife (e.g. secure fencing) see specification sheet for details of cover (lid) used and its load rating.
- 10) If the tank is sited in a driveway it must be surrounded in concrete, and a reinforced concrete slab (min. 200mm thick) must be used to spread the load away from the tank on to a firm surround

3.3 Cover Installation

When using cast iron load bearing cover, tie cover in with surrounding concrete continuing or support cover by continuing concrete up sides to top of tank. If the tank is supplied with an aluminium cover, this must be installed in a way that precludes direct loading (e.g. with the use of bollards).

3.4 Pipework Installation

Inlet pipe and tank penetrations to be made on site will require rubber wall seals. The wall seal will require a circular hole to be cut in the tank using a hole saw in the correct position. Once the hole is cut, debur the hole and insert the rubber wall seal. Once the seal is inserted, insert the pipe through the wall seal to create waterproof seal.

3.5 Pump Installation

The pump is supplied with a level float switch and power cable as standard. The pump must not be lifted by the power or float switch cable. A clearly marked dedicated circuit of an adequate capacity must be used.

- 1) Check the pump's connections for any loose connections prior to use as items can be affected by vibrations during transport.
- 2) Check the pump's rating plate and ensure that the proposed power supply is suitable.
- 3) Check that the actual delivery head is within the performance capabilities of the pump.

- 4) Always connect the electrical supply before performing maintenance
- 5) If installing a three phase pump, check the correct direction of rotation before installation in the tank.
- 6) Ensure the tank is of sufficient size for the pump's float switch to operate without obstruction
- 7) Where possible, pumps should be placed on a raised surface rather than on the bottom of the tank
- 8) Ensure that the tank and pipe work are cleaned on completion of construction work to ensure debris is removed
- 9) Always ensure a check valve is installed on the discharge side of the pump to prevent back flow.

CAUTION

When operating pumps:

- Do not allow the pump to run dry
- Never lift a pump by the power cable
- Do not allow the pump to operate for long periods with the motor fully exposed
- Do not install the pump on loose or soft ground
- Do not leave the pump installed for long periods (typically over 2 months) without operation

3.6 High Level Alarm

Install the high level float switch with the lowest inlet invert level. Ensure that pumps do not run dry for any period of time.

3.7 Completion Checklist

Check	
All penetrations sealed	
Conduits installed	
Vent installed and completed	
Rising main completed and tested	
Access covers installed and sealed	
Permanent power completed	
Test water available	
Tank dry and cleaned out (sand, gravel, concrete etc.)	

4. Commissioning

This section is designed to give the recommended procedures – and check lists – to start-up and commission the pumping station following completion of installation. These procedures will normally be carried out by Dutypoint engineers but are included anyway - to provide a record and assist others should the need to re-commission the system arise later – e.g: after a prolonged shut-down.

DO NOT START ANY WORK ON THIS EQUIPMENT UNTIL:

- You have read the health and safety sections of this manual
- You are wearing the correct protective clothing
- You have all necessary safety equipment to hand

4.1 Pre-Requisites

Before pre-commissioning tests can be carried out, a check should be made to ensure that the necessary facilities and materials are available and in full working order. A check list is given in the table below for guidance:

Table 4.2: Pre-Commissioning Checks

Item/Reference	Schedule	<input type="checkbox"/>
Mechanical	Lubricants	
	Inlet flow of clean water – initially for test purposes – available at the Station	
Electrical	Electrical supply to the station control panel.	
Mechanical Components	Check oil levels in the pump gearboxes and ensure these are at correct working level – see Pump Manual included in the Appendix to this manual	
	Check access covers for fit and that keys are available (if applicable)	
	Check there is no debris left in the tank	
	Check the security of guide rails & mountings	
	Check pump auto location on the duck foot connections and that the pumps are free to lift vertically on their guide rails	
	Check the lifting chains are securely attached	
	Check the switches are correctly positioned	
Motors	Check that the motor voltage and frequency information on the motor data plates corresponds with the supply voltage at the Control Panel	
	Check that the direction of rotation of each motor corresponds with the direction arrow on the pump	
Pipework and Valves	Check all joints are tight	
	Check Sluice (manual isolating) valve operation and the lever/weight operation of the Non-Return (Check) valves	

Item/Reference	Schedule	<input type="checkbox"/>
Electrical	Check all connections (including earths) are correctly made and secure	
	Check all voltage correspond with those stated on the individual equipment data plates	
	Check earth bonding	
	Check pump cables: correct suspension etc.	
	Check float switches	
	Check overload setting in the control panel	
	Carry out all statutory electrical circuit checks	

5. Operation and Maintenance

DANGER!

The chamber should not be entered by persons unless absolutely necessary. The system is designed to facilitate pump removal and component servicing from the surface. In case of entry being unavoidable:

- All safety procedures must be followed in accordance with current regulations and laws
 - Any personnel entering the tank must be certified for confined space entry
 - Risk assessments must be completed
 - The chamber must be evacuated of dangerous gases
 - Breathing apparatus must be used
-

The system is automatically controlled and activated via level sensors.

5.1 Routine Maintenance

When a pump station is initially commissioned it should be checked daily for the first week to check that all the systems are working correctly. Particular care should be taken with a new installation that foreign matter such as concrete, silt, gravel, timber or tools do not foul the pump.

Routine maintenance and servicing are essential to maintain the plant in a serviceable condition.

The station should be visited on a 6-12month basis to check the pumps operation, record the above data and hose off any build-up of fats or foreign material in the wet well, and grease the pump station access lids.

A high degree of cleanliness of the equipment and surrounding area should be maintained as this will assist in the detection of minor defects, which, if no action was taken, could lead to more serious problems.

The main factors in determining if a major overhaul is required is a falling off in the pump discharge pressure to an unsatisfactory level or a significant increase in power consumption or pump running time.

Depending on operation and environmental conditions with a comparison of previous inspections, the frequency of inspections can be altered to maintain satisfactory operation of the plant to suit established operation routines.

The checks and inspections carried out during the running-in period will often establish the frequency of future inspections (minimum of 12 month service intervals).

6. Troubleshooting

The troubleshooting tables which follow in this section are a collation of recommendations laid down by the manufacturers of the principal equipment/components included in the pumping station.

DO NOT START ANY WORK ON THIS EQUIPMENT UNTIL:

Do not start any work on this equipment unit:

- You are wearing the correct protective clothing
- You have all necessary safety equipment to hand
- You have read Section [1. Important Safety Information](#) (p. 4) and Section [2. Waste Water Safety](#) (p. 10)

6.1 General Troubleshooting

The following is a guide to diagnose and rectify the most common problems that may arise. This guide should only be used by qualified maintenance personnel. As with any troubleshooting procedure, start with the simplest solution first: always make the above ground checks before removing the pump from the tank. Before embarking on any trouble shooting action ensure you read all the warnings at the beginning of this manual.

Problem	Possible Causes	Actions
Pump will not start	Fuses blown or overload trip	Check and replace if necessary
	Float switches obstructed or not functioning.	Check if pump will operate manually where possible
Pump starts but cuts out almost immediately	Overload settings on power supply incorrect	Check and rectify
	Incorrect voltage	Check and rectify
	Pump is blocked	Isolate power, then check.
Pump is turning on and off quickly	Check valve is not functioning correctly	Check and replace if necessary
	Turbulence in water is causing floats to rise and fall quickly	Check inlets are suitable for the application.
Pump is running but not delivering liquid	Gate valve is closed	Open valve
	Check valve is blocked	Unblock
	Pump inlet is blocked	Hose and clean out tank
	Pump is air locked	Elevate pump to release air lock
Pump running but delivering too little liquid	Inlet partially blocked	Hose and clean tank
	Excessive wear on impeller and/or wear plate	Contact a pump servicing engineer

Problem	Possible Causes	Actions
Pump station smells	Tank lids are sealed	Hose and clean out tank
	Pump station is vented and vent is unblocked	Evacuate chamber, re-grease seals
	Waste is going septic prior to station	Check operational procedures
Pump stops in normal service	Motor winding over-temperature	<ol style="list-style-type: none"> 1) Leave out of service to cool down and try again 2) If the problem recurs, call an electrician to check the circuit wiring and loads OR 3) Isolate electrically and mechanically, separate the impeller assembly from the pump casing and lift it clear for detailed inspection or repair as necessary.
	Motor overload.	<ol style="list-style-type: none"> 1) Check and reset the overload and then try again. To reset, first isolate the supply to the panel by selecting Off at the Control Panel Isolator, then unlock and open the panel door. Press the RESET button on the top of the appropriate pump Thermal Overload Heater assembly. 2) Close and lock the panel door and switch both pump HAND/Off/AUTO switches to Off. Switch the Panel Isolator to ON and then select HAND on the affected pump. The pump should now start and run normally. 3) Switch the Pump to Off again and then re-select AUTO on both pump control switches. The normal pumping cycle should now restart itself automatically, the first 'Duty' pump being the one which was not in service at the time of the trip. 4) Watch the system through a complete cycle to ensure the pump which tripped will re-start and run again in AUTO mode.

6.2 Control Panel Troubleshooting

DANGER OF ELECTRIC SHOCK!

Do not commence work on the control panel unless:

- You hold a suitable electrical qualification
- You have the wiring diagram to hand
- You have read Section [1. Important Safety Information](#) (p. 4) and Section [2. Waste Water Safety](#) (p. 10)

Table 6.3: Fault: Overload relays trip intermittently

Possible Causes	Recommended Action
Incorrect overload setting	Check overload setting
Motor mechanically overloaded.	Check bearings and lubrication points on motor and pump
Components mounted where they are subject to excessive vibration	Check and rectify
Large variations in supply voltage	Check and rectify

Table 6.4: Fault: Overload relays fail to trip on overload

Possible Causes	Recommended Action
Incorrect overload setting	Check overload setting

Table 6.5: Fault: Overload relays trip on starting

Possible Causes	Recommended Action
Incorrect overload setting	Check overload setting
Repetitive starts over a short period exceed the motor duty cycle	Check bearings and lubrication points on motor and pump
Motor mechanically overloaded	Check and rectify

Table 6.6: Fault: Starter operates sluggishly

Possible Causes	Recommended Action
Supply voltage too low	Check and rectify

Table 6.7: Fault: Starter operates but motor does not rotate

Possible Causes	Recommended Action
Incorrect wiring connections	Check connections between motor supply terminals and starter output terminals
Faulty motor	Refer to motor manufacturer's data sheets

Table 6.8: Fault: Starter will not operate when switched on, either in HAND or AUTO modes

Possible Causes	Recommended Action
Incorrect wiring connections	Check all connections are correctly made and secure.
Fault detection device(s) – e.g: overload or over-temperature sensor in pump motor – incorrectly set.	Check and rectify
Starter contactor coil faulty	Check continuity on starter coil – replace as necessary.

Table 6.9: Fault: Contactor coil hums but contacts do not close correctly

Possible Causes	Recommended Action
Control supply voltage too low	Check and rectify
Contactor coil open-circuit or damaged.	Check and replace coil
Foreign matter – e.g: swarf – lodged in contactor mechanism	Check and clear any obstructions

Table 6.10: Fault: Starter circuit – and thus the pump - fails to stop

Possible Causes	Recommended Action
Magnetic circuit or start relay mechanism jammed in	Check and rectify
Start/Stop circuit incorrectly wired	Check against circuit diagram and rectify accordingly
Contactor contacts welded together	Check and replace with new set

Table 6.11: Fault: Starter circuit – and thus the pump - fails to stop

Possible Causes	Recommended Action
One of the main phase fuses blown	Check and replace
One of the motor windings open-circuit	Check and repair or replace motor as necessary
Motor supply cables incorrectly connected	Check against circuit diagram and rectify accordingly.
One of the contacts at the Contactor not closing correctly.	Check and replace with new set of contacts

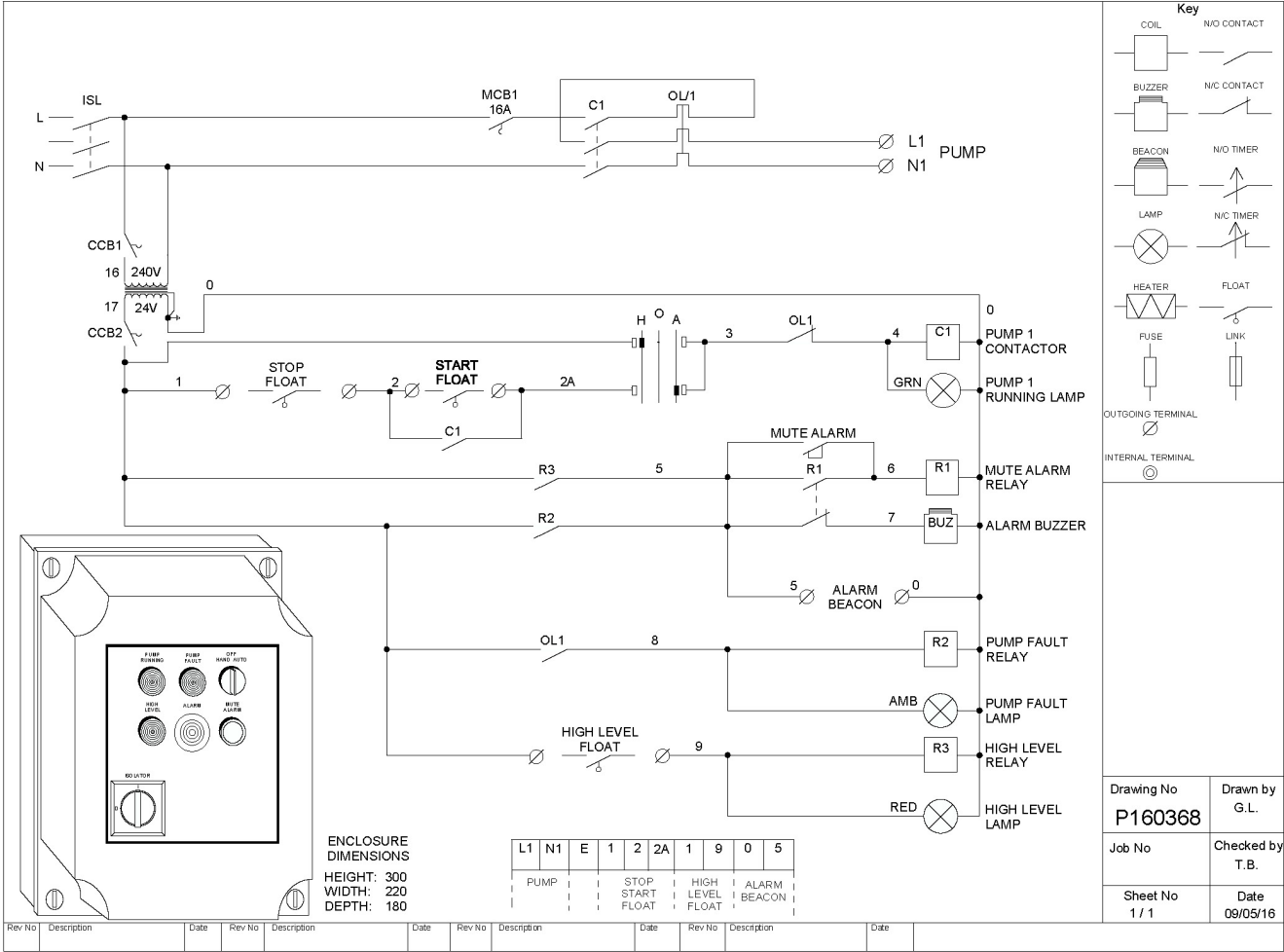
7. Control Panel Wiring Diagrams

This section contains details of all control panels which may be supplied with this product. Ensure you check the model plate on the control panel and select the corresponding diagrams in this section:

- 7.1 CK01M (p. 24)
- 7.2 CK03M (p. 25)
- 7.3 CK03MC (p. 26)
- 7.4 CK08T (p. 27)
- 7.5 CK09T (p. 29)
- 7.6 CK13M (p. 30)
- 7.7 CK13MC (p. 31)
- 7.8 CK13MC PRO (p. 33)
- 7.9 CK19T (p. 37)
- 7.10 CK19T PRO (p. 39)
- 7.11 CK20T PRO (p. 41)

7.1 CK01M

Figure 7.2: CK01M Wiring Diagram Sheet 1 of 1



7.2 CK03M

Figure 7.3: CK03M Wiring Diagram Sheet 1 of 2

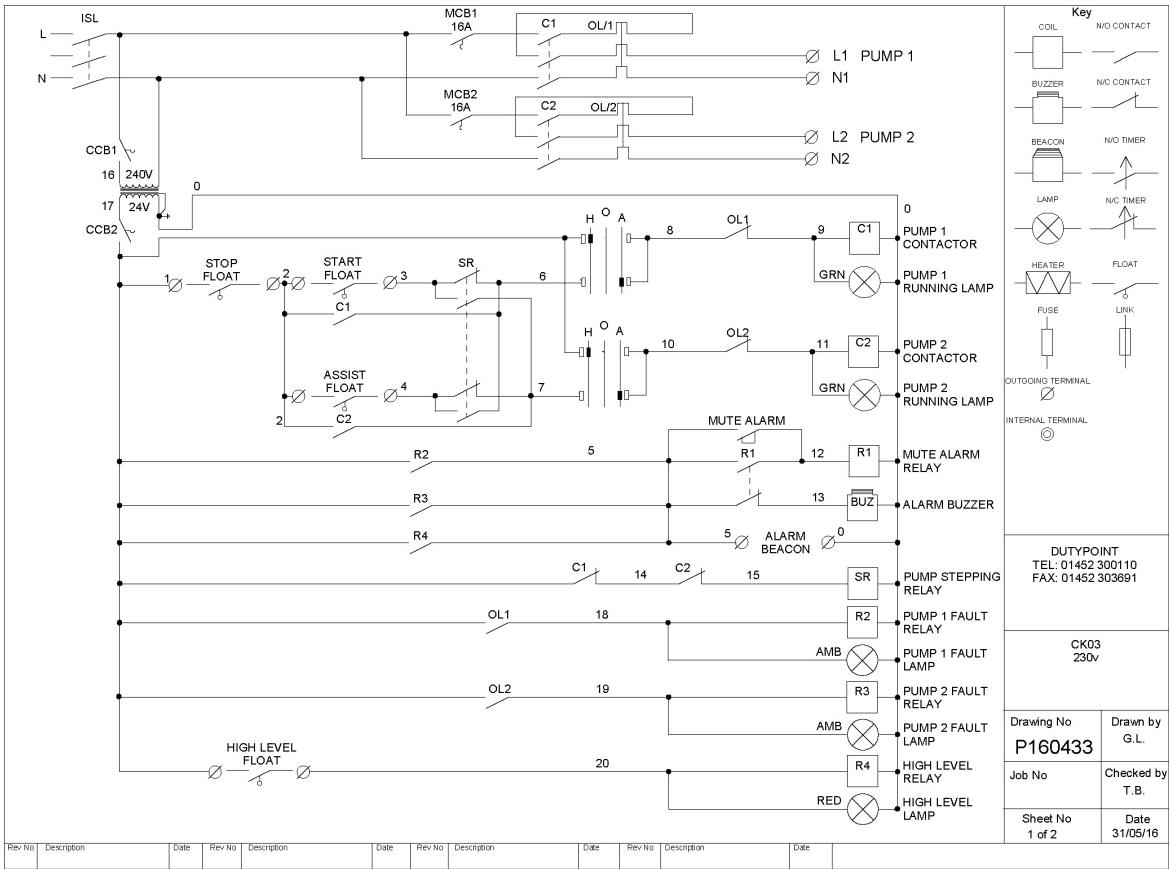
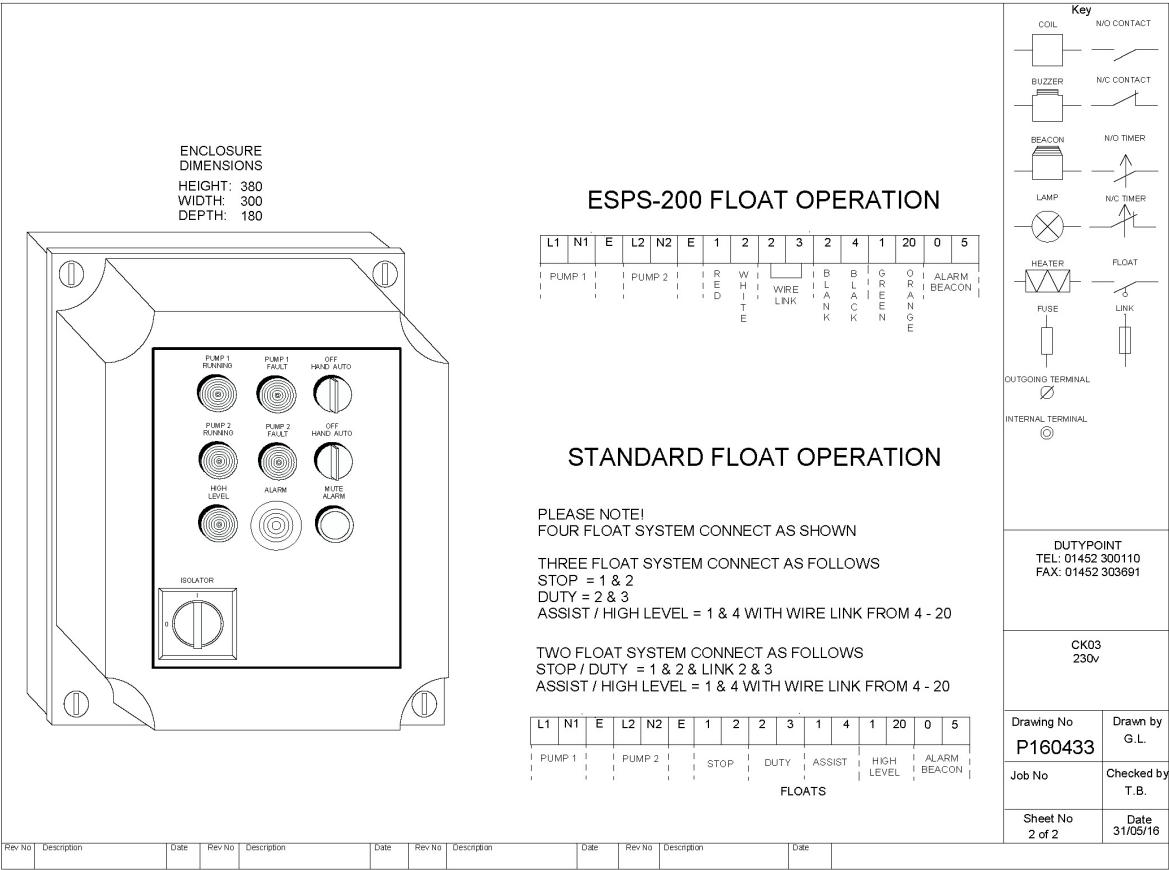


Figure 7.4: CK03M Wiring Diagram Sheet 2 of 2



7.3 CK03MC

Figure 7.5: CK03MC Wiring Diagram Sheet 1 of 2

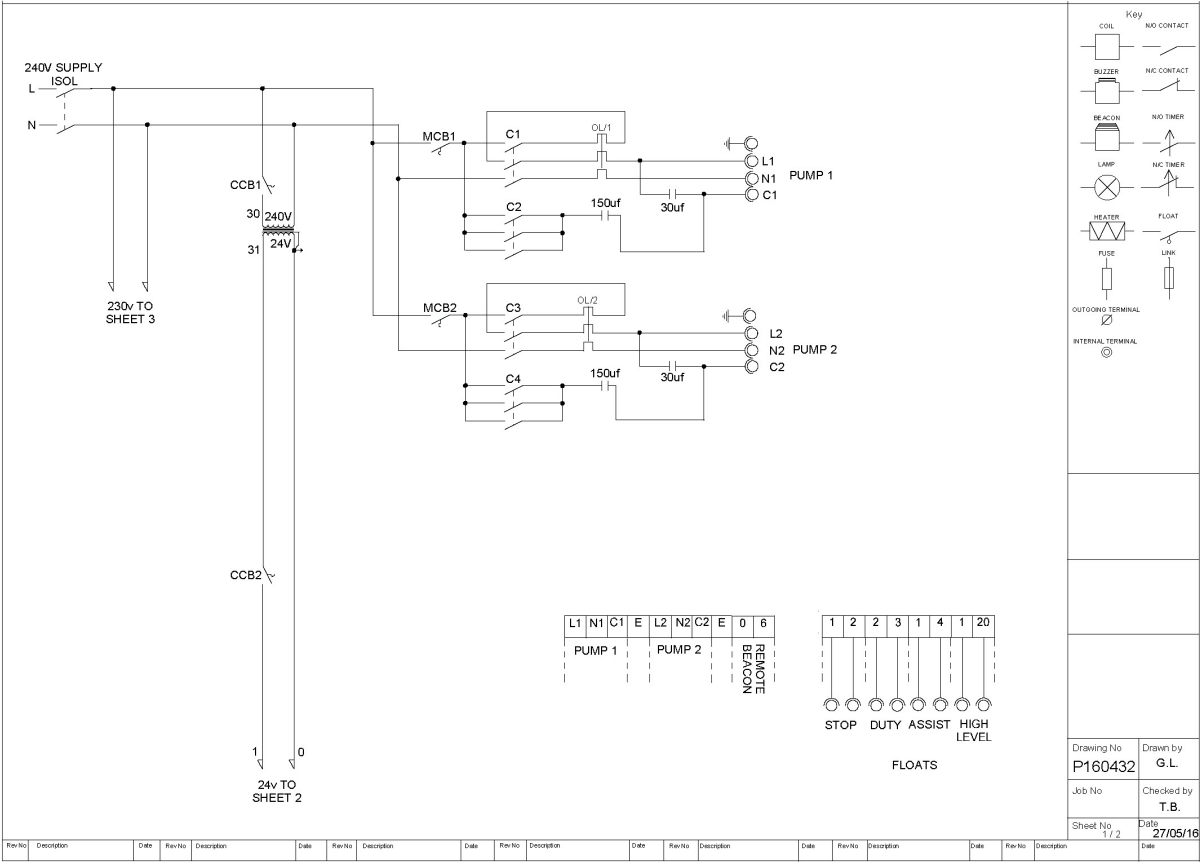
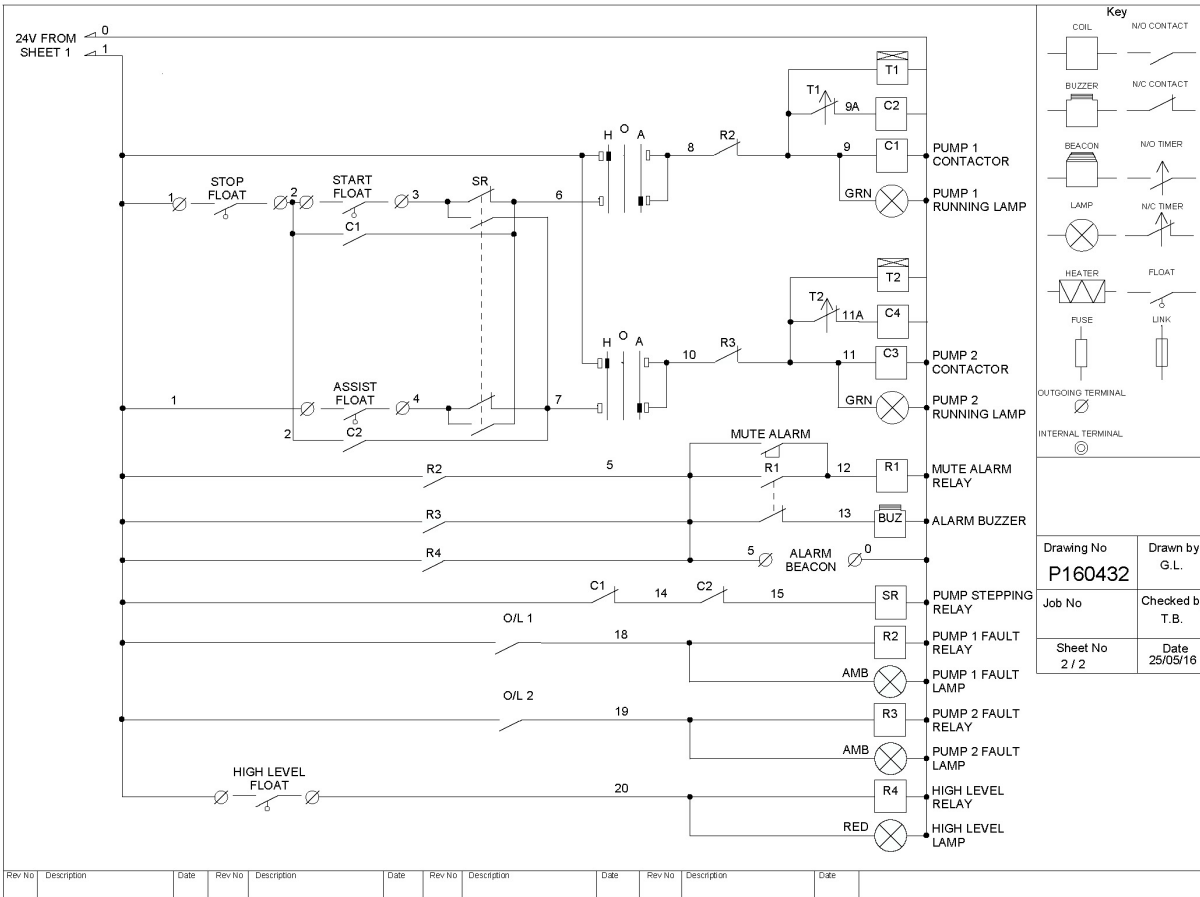
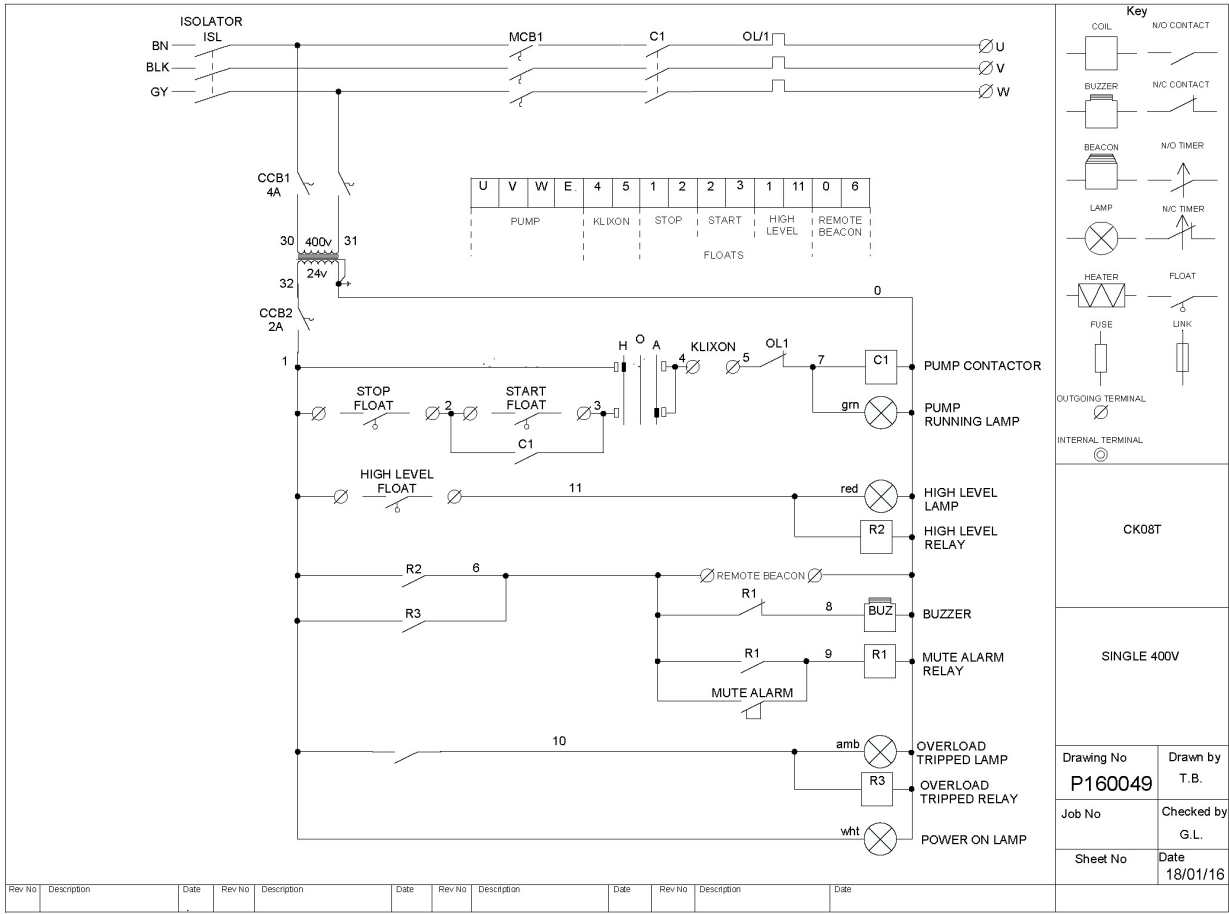


Figure 7.6: CK03MC Wiring Diagram Sheet 2 of 2



7.4 CK08T

Figure 7.7: CK08T Wiring Diagram Sheet 1 of 2



7.5 CK09T

Figure 7.9: CK09T Wiring Diagram Sheet 1 of 2

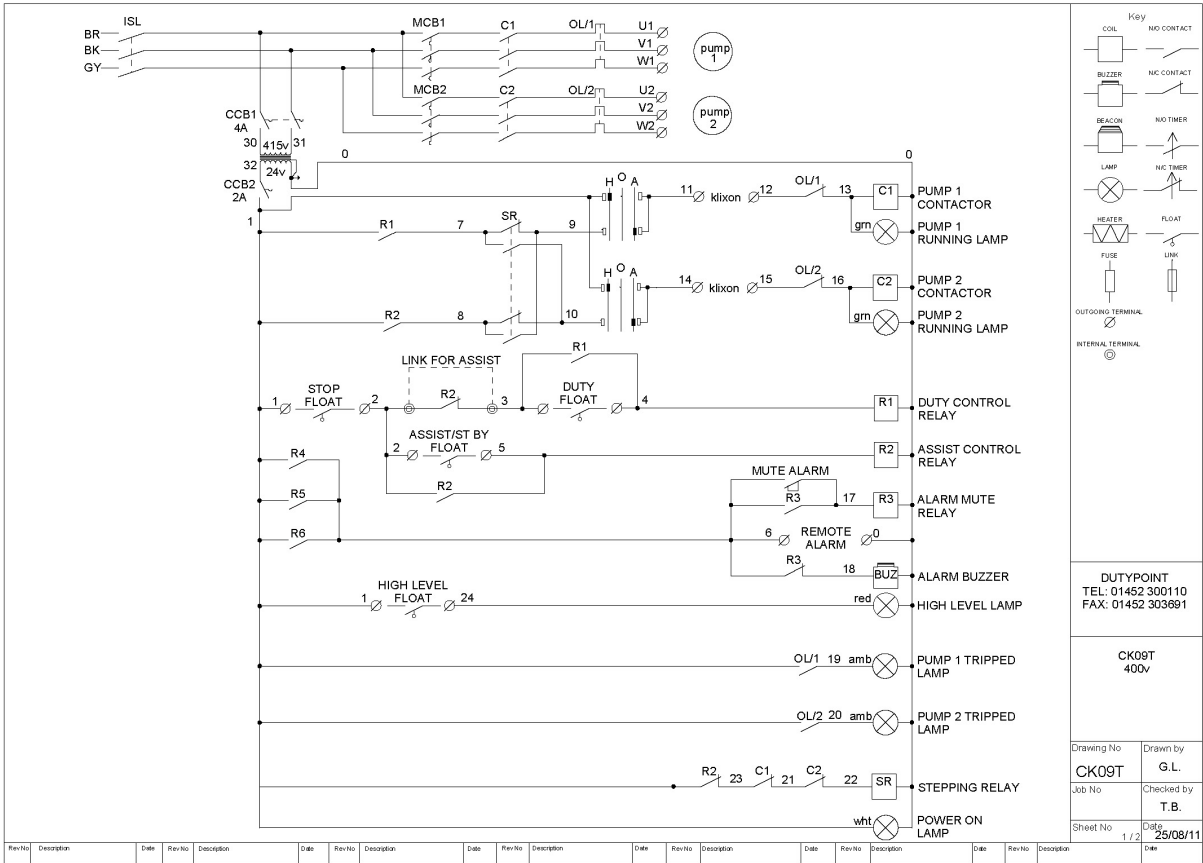
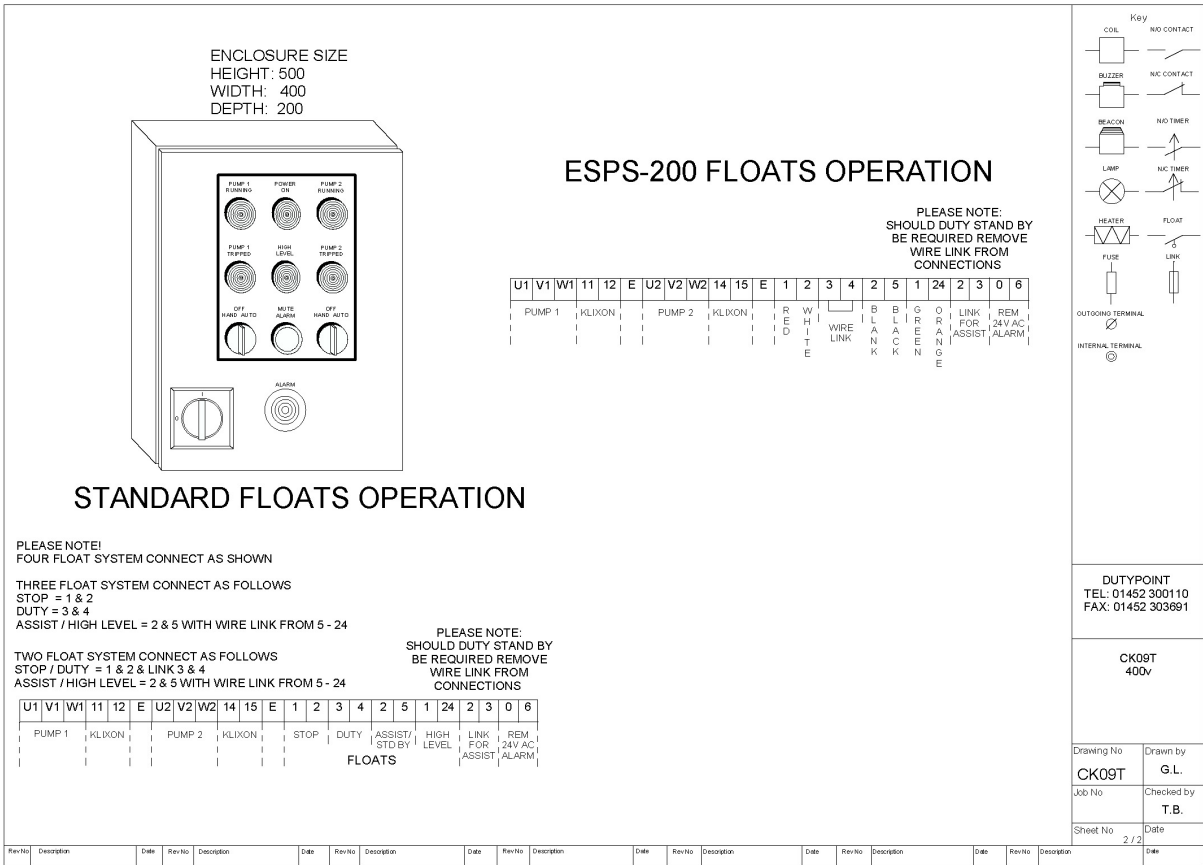


Figure 7.10: CK09T Wiring Diagram Sheet 2 of 2



7.6 CK13M

Figure 7.11: CK13M Wiring Diagram Sheet 1 of 3

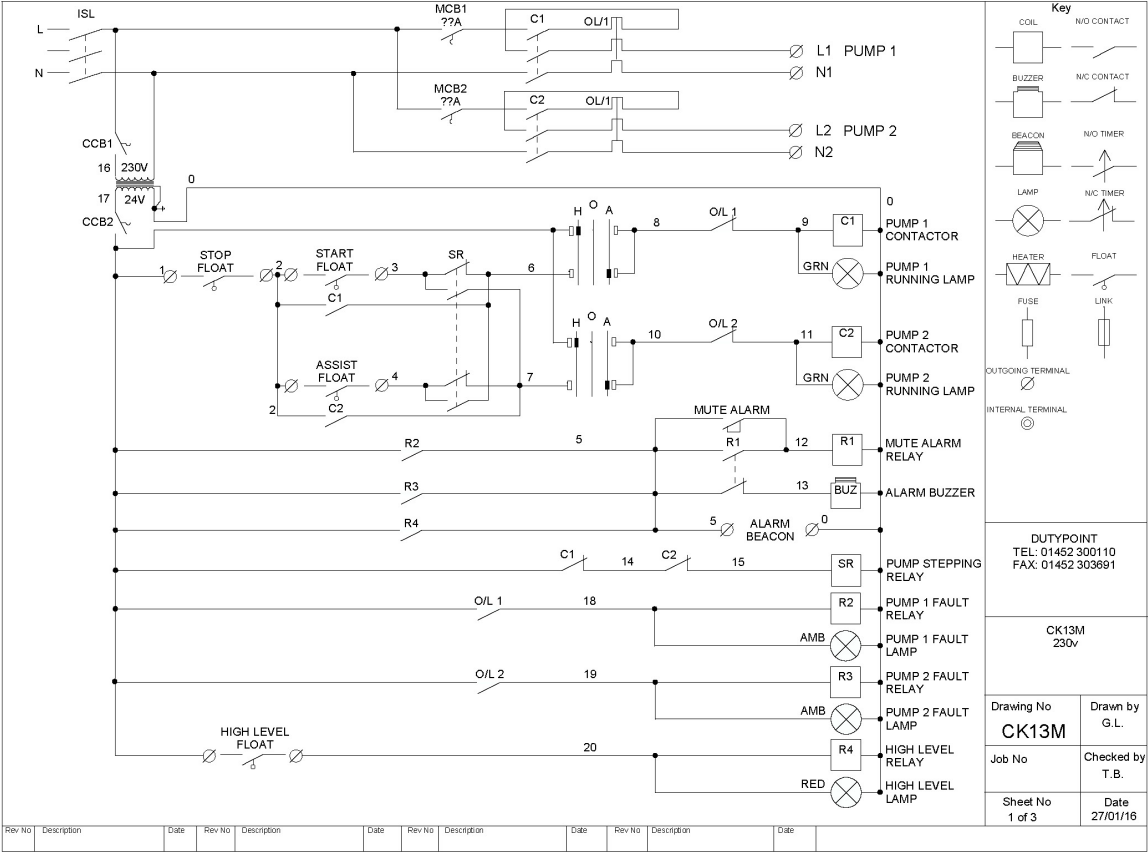


Figure 7.12: CK13M Wiring Diagram Sheet 2 of 3

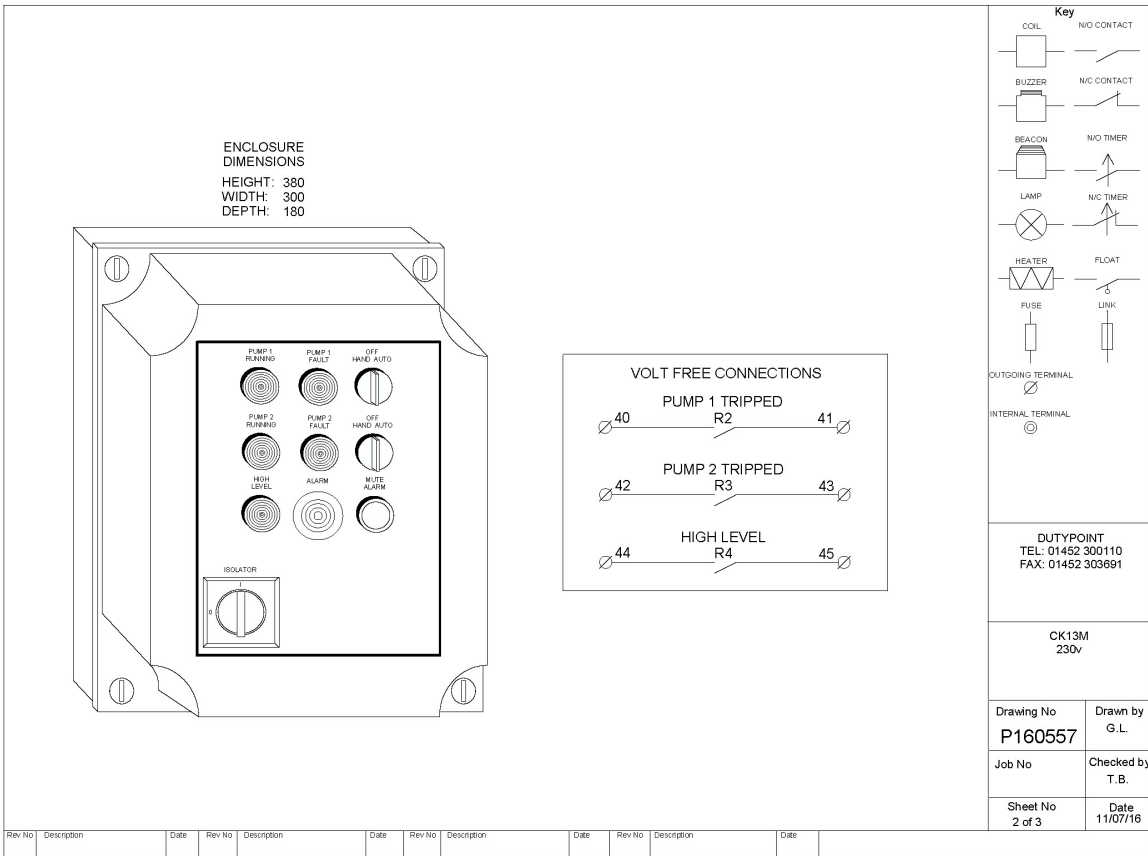
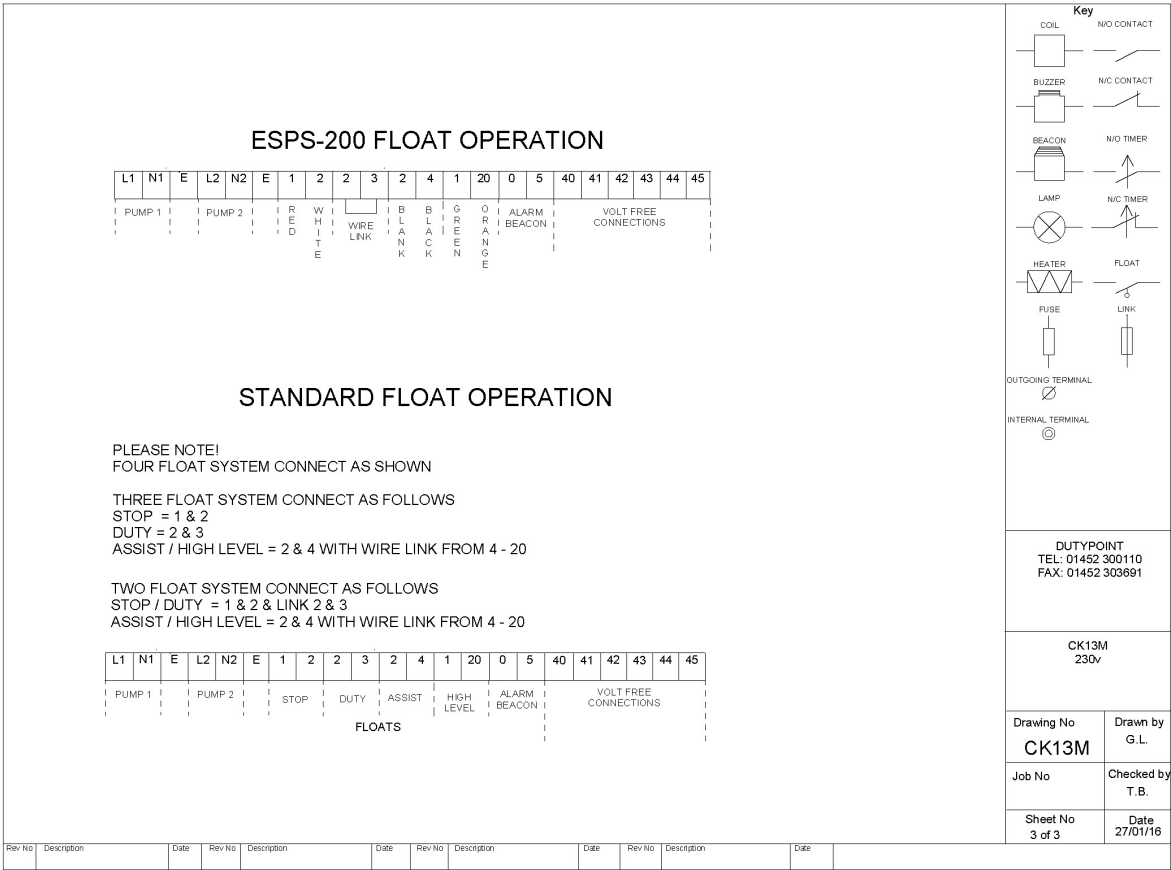


Figure 7.13: CK13M Wiring Diagram Sheet 2 of 3



7.7 CK13MC

Figure 7.14: CK13MC Wiring Diagram Sheet 1 of 3

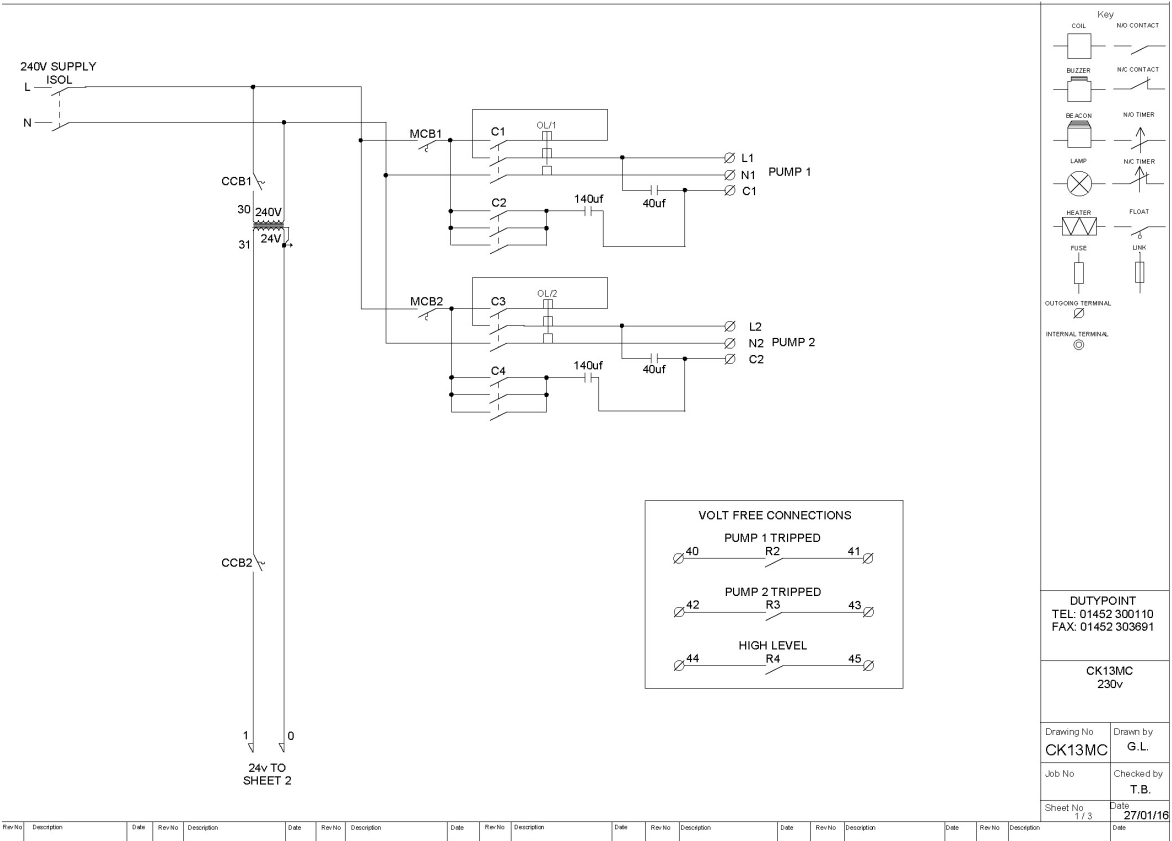


Figure 7.15: CK13MC Wiring Diagram Sheet 2 of 3

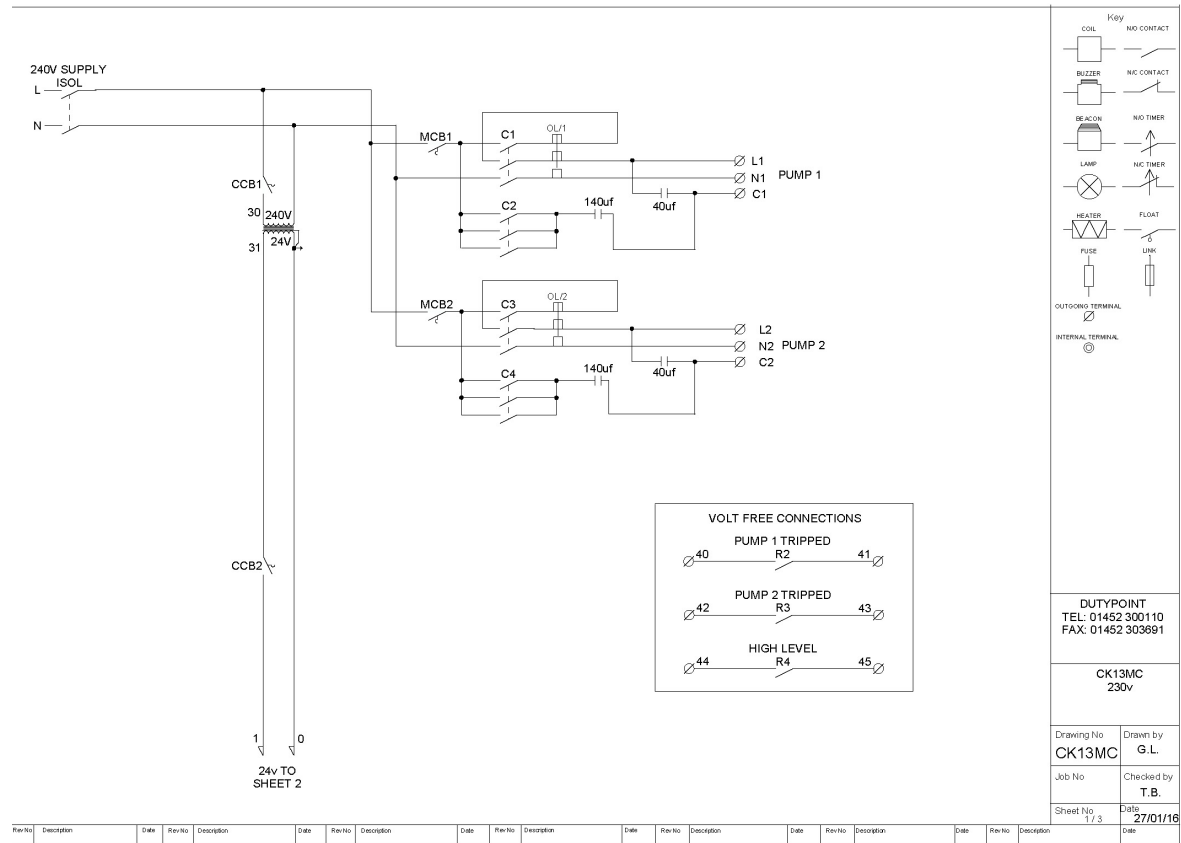
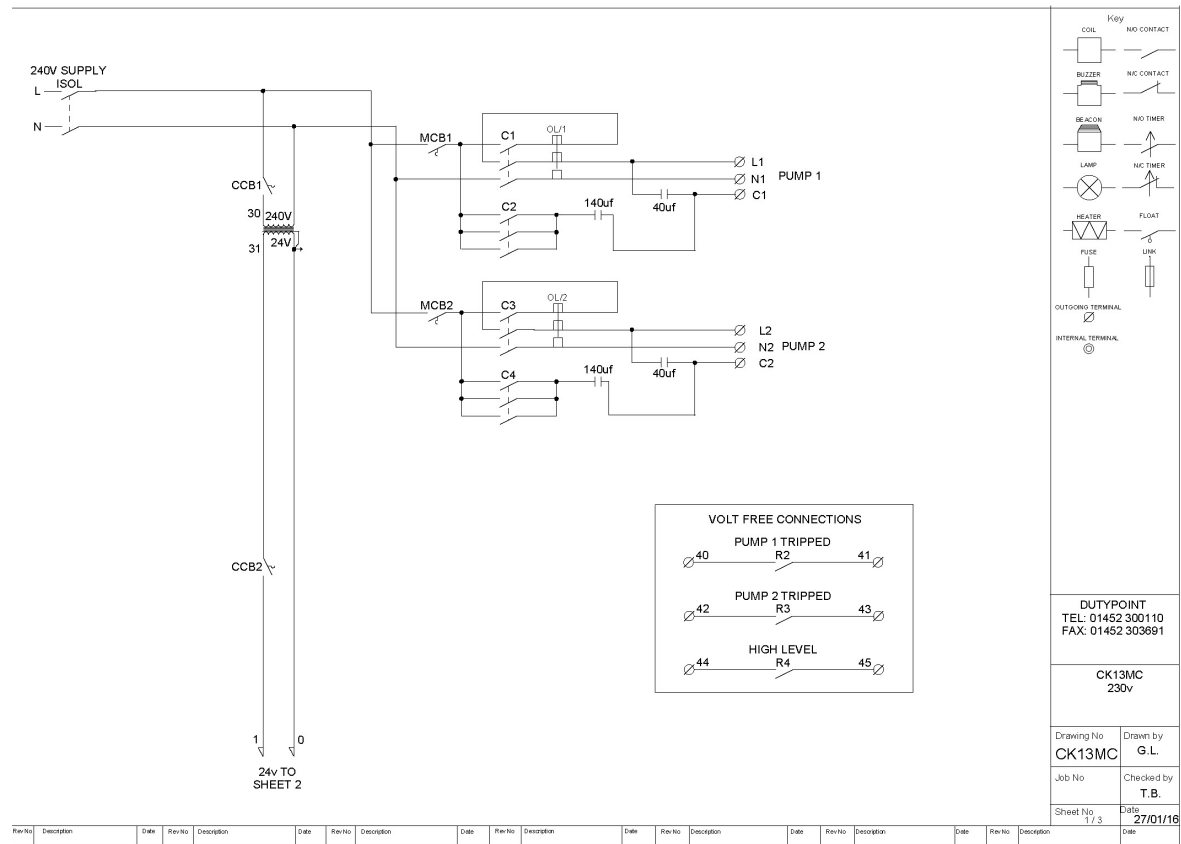


Figure 7.16: CK13MC Wiring Diagram Sheet 3 of 3



7.8 CK13MC PRO

Figure 7.17: CK13MC PRO Wiring Diagram Sheet 1 of 4

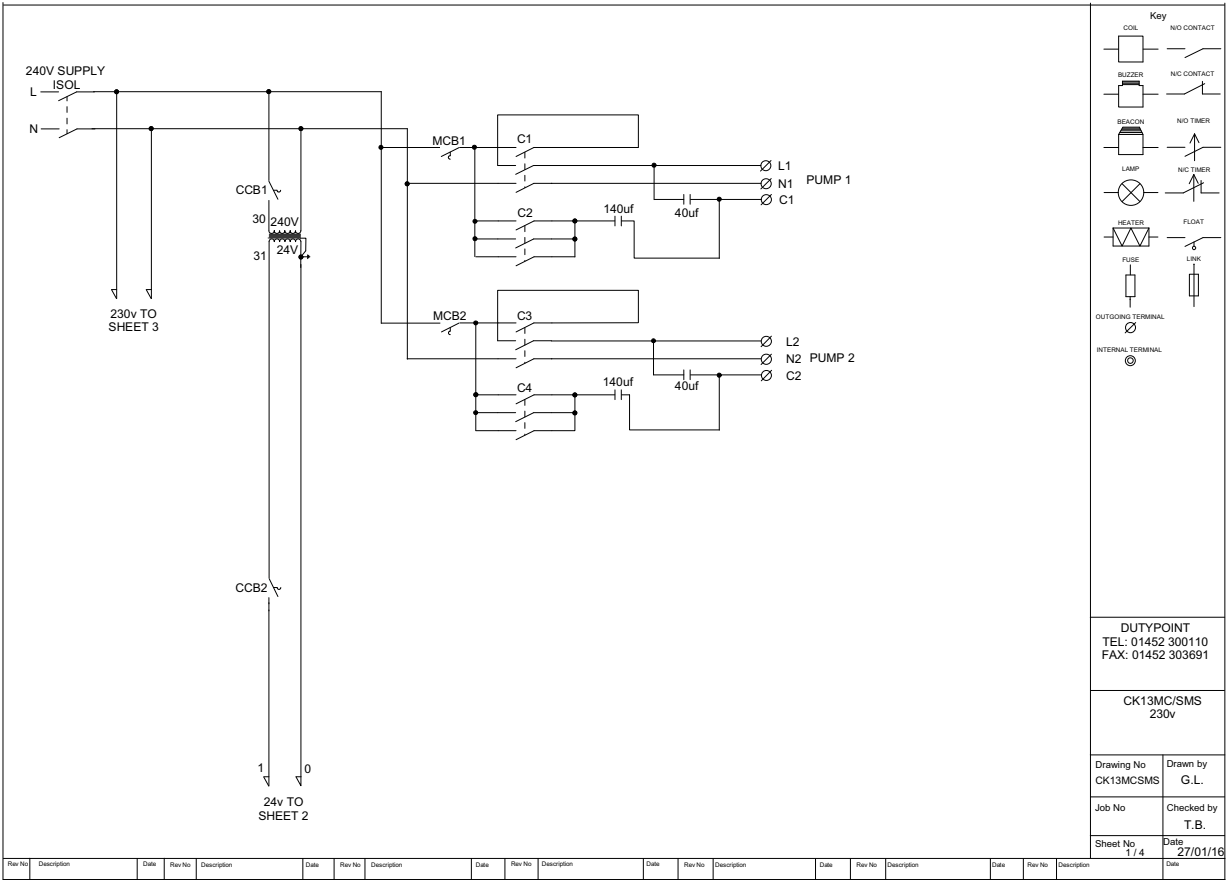


Figure 7.18: CK13MC PRO Wiring Diagram Sheet 1 of 4

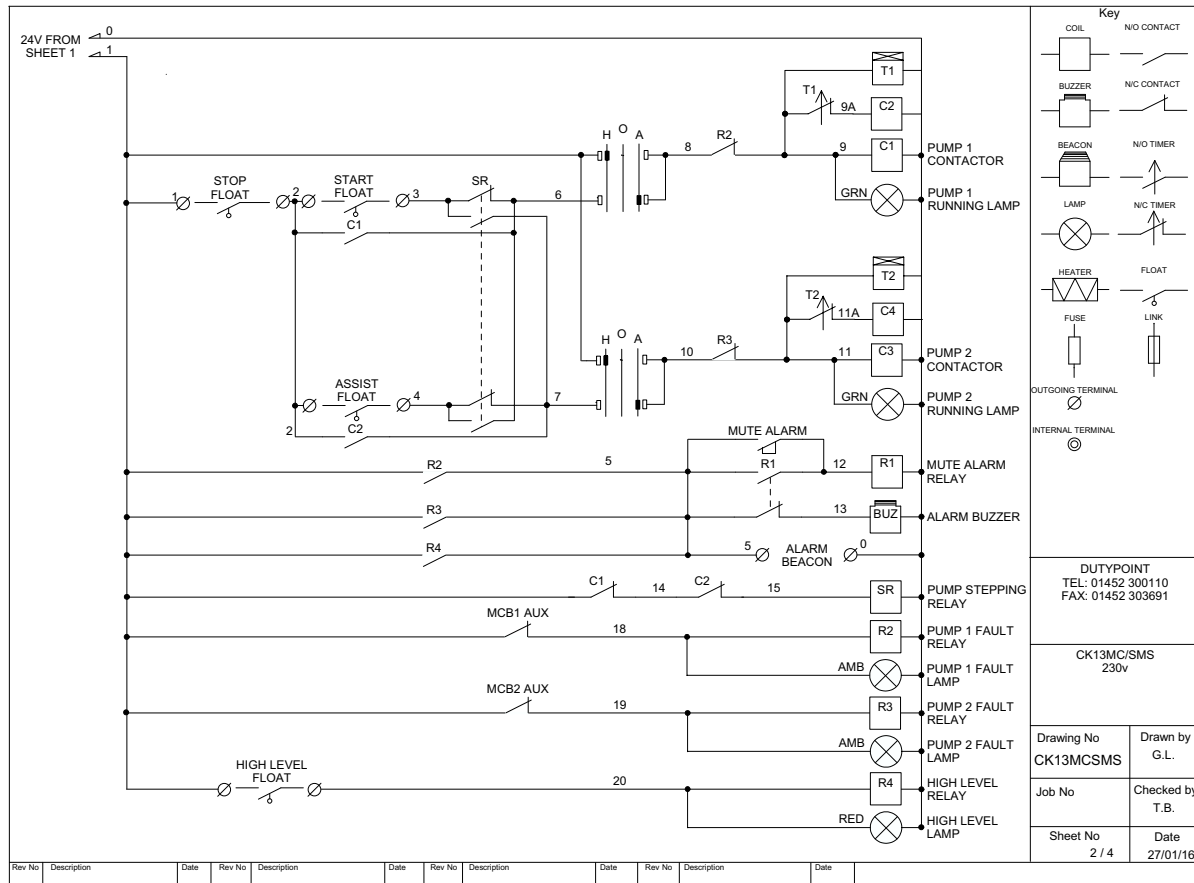


Figure 7.19: CK13MC PRO Wiring Diagram Sheet 1 of 4

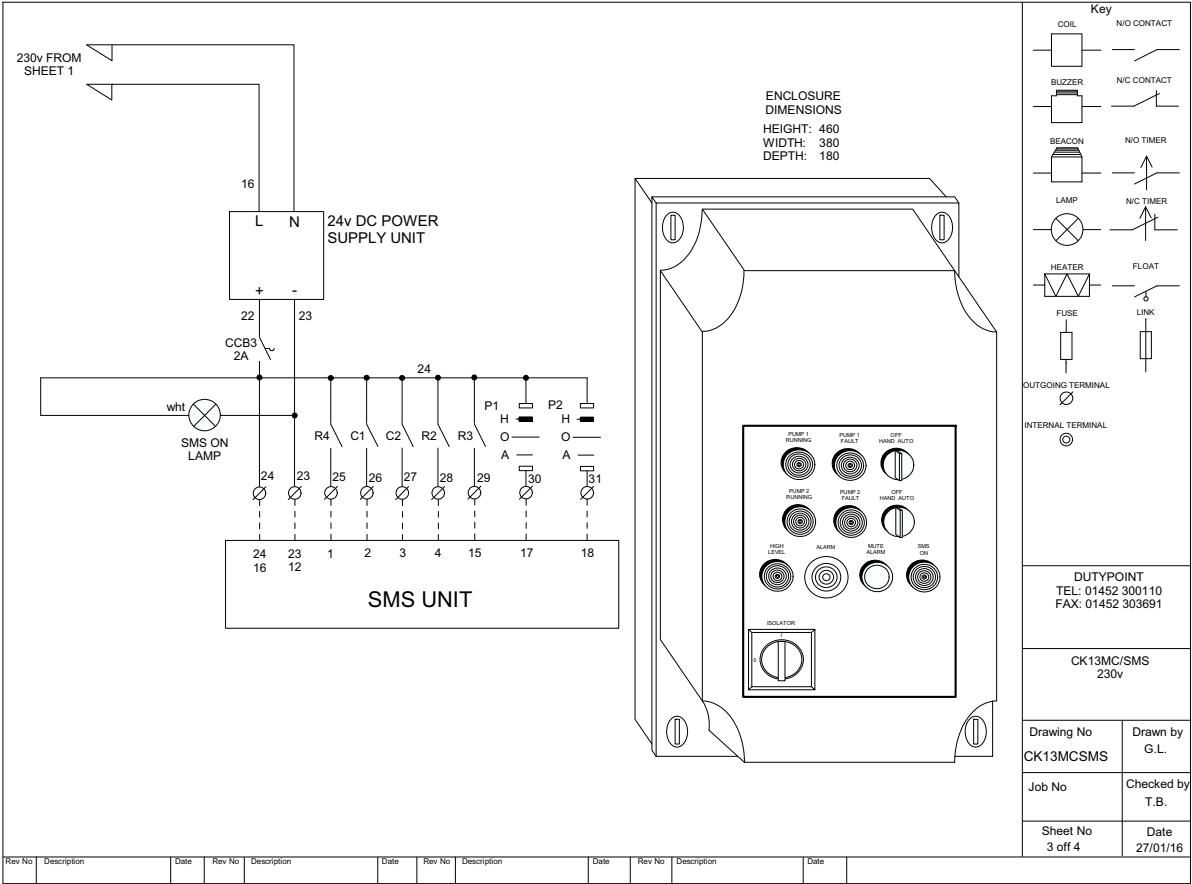
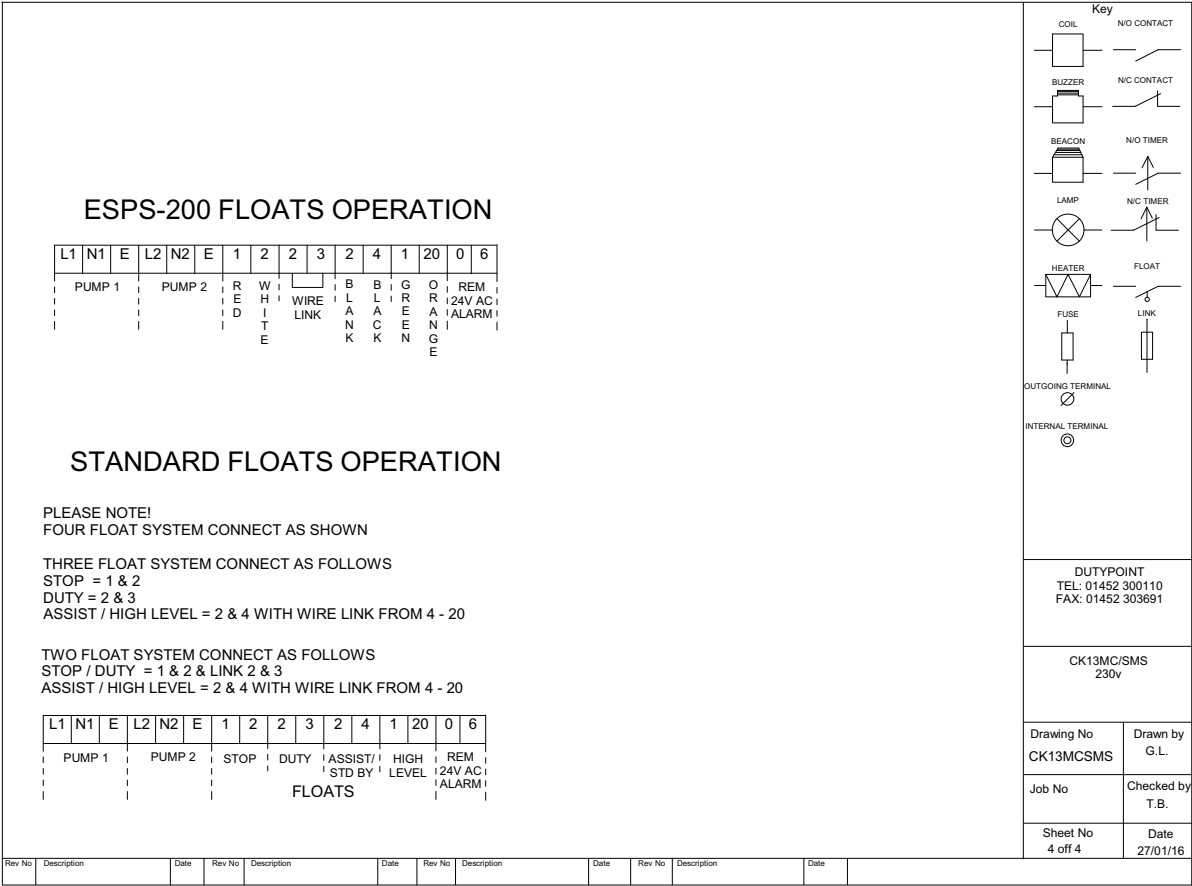


Figure 7.20: CK13MC PRO Wiring Diagram Sheet 1 of 4



7.9 CK19T

Figure 7.21: CK19T Wiring Diagram Sheet 1 of 2

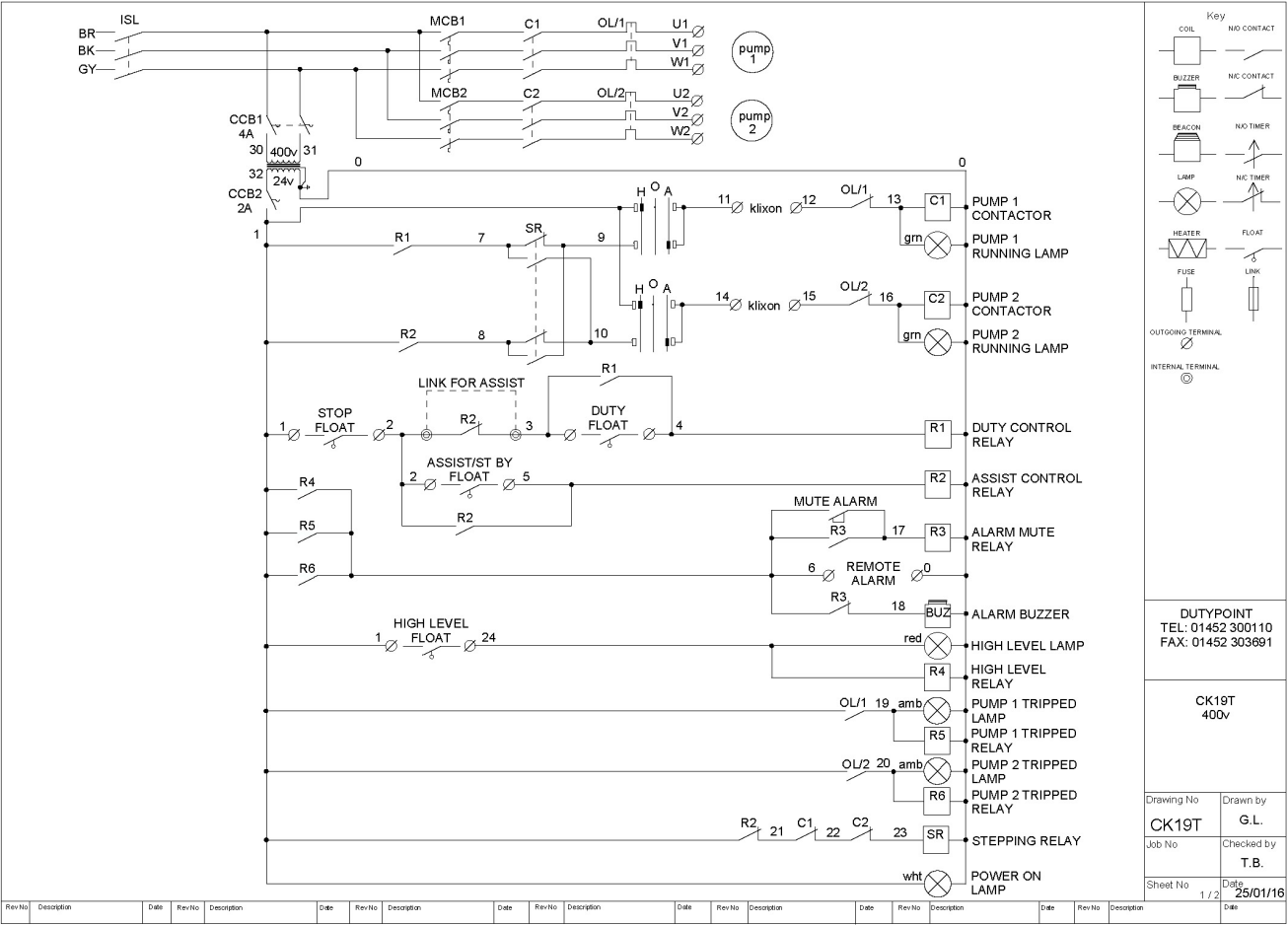
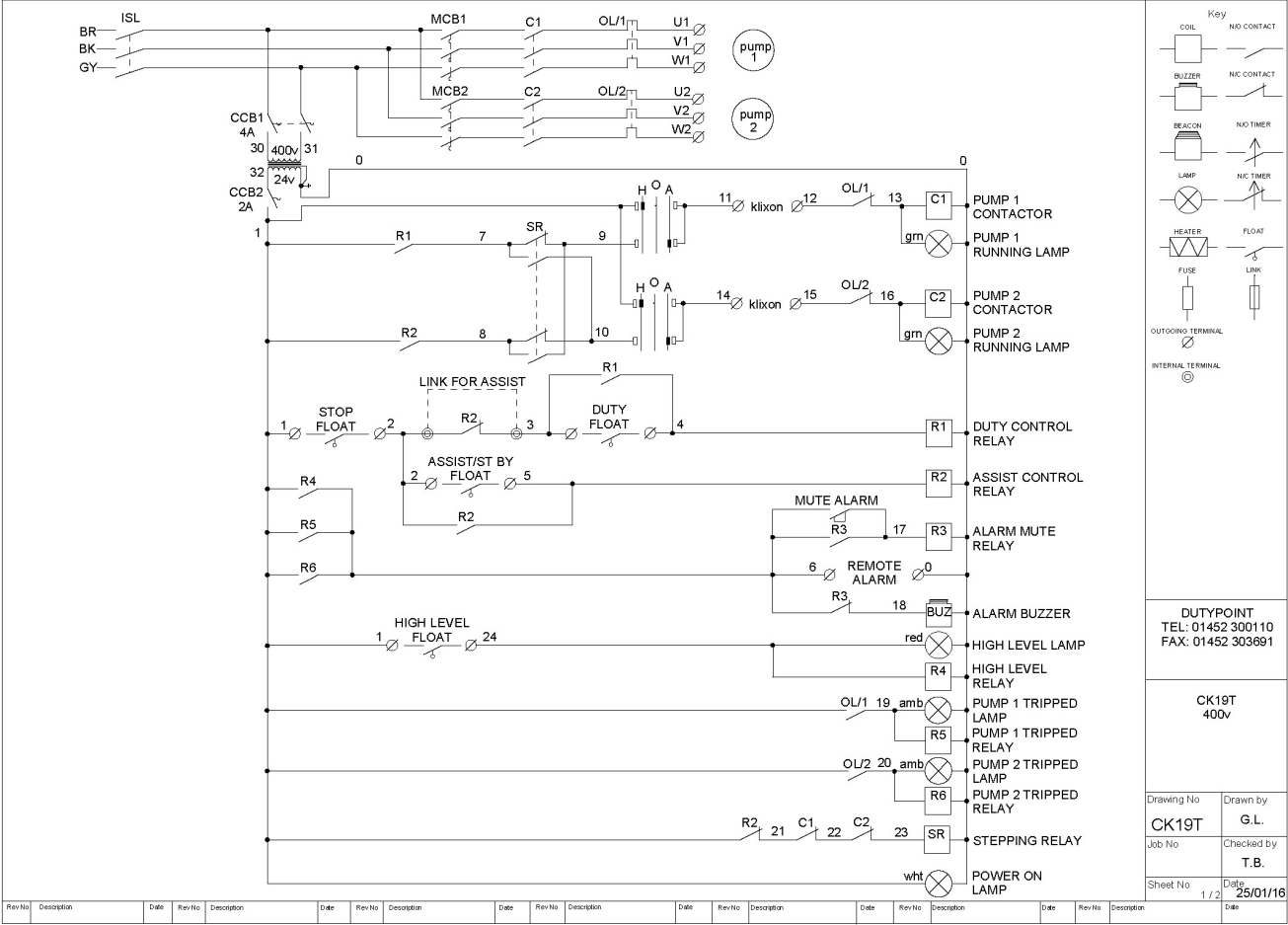


Figure 7.22: CK19T Wiring Diagram Sheet 2 of 2



7.10 CK19T PRO

Figure 7.23: CK19T PRO Wiring Diagram Sheet 1 of 2

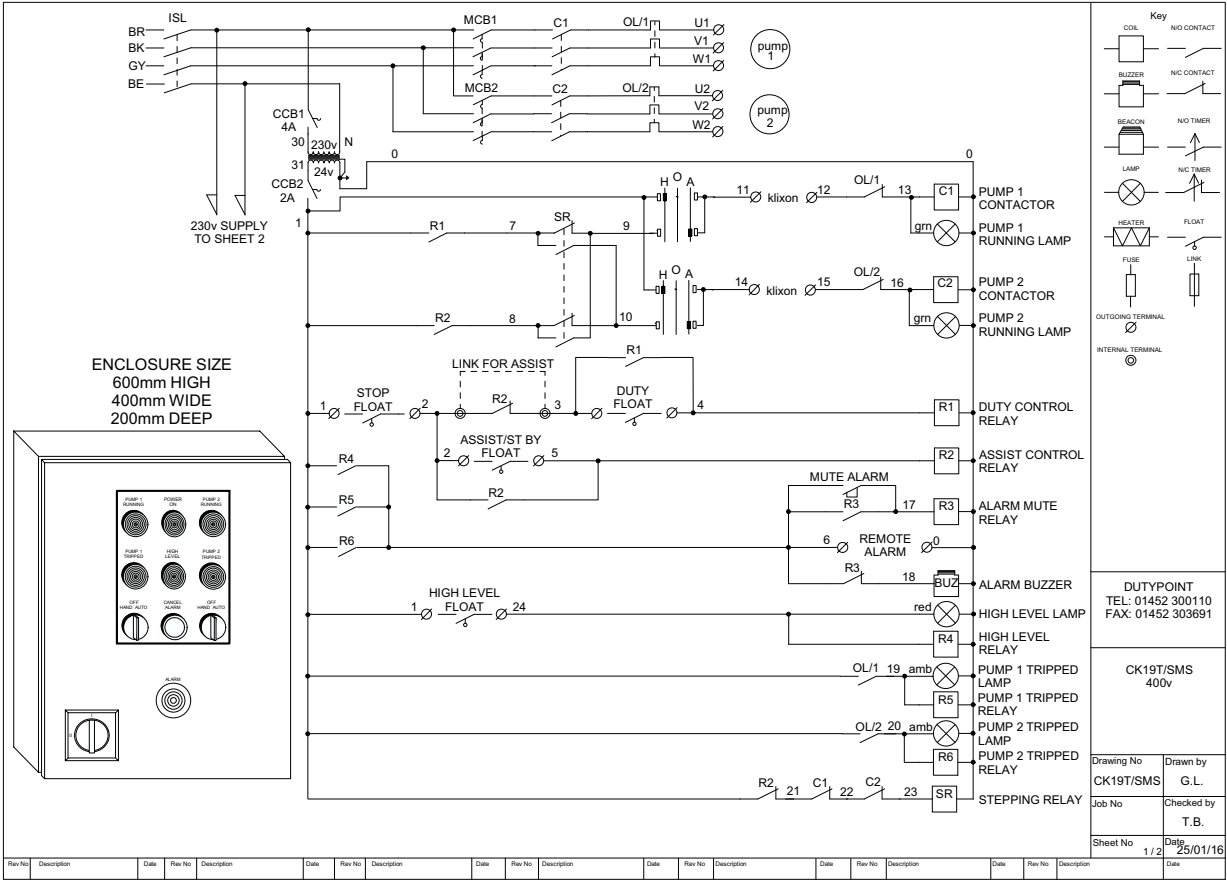


Figure 7.24: CK19T PRO Wiring Diagram Sheet 2 of 2

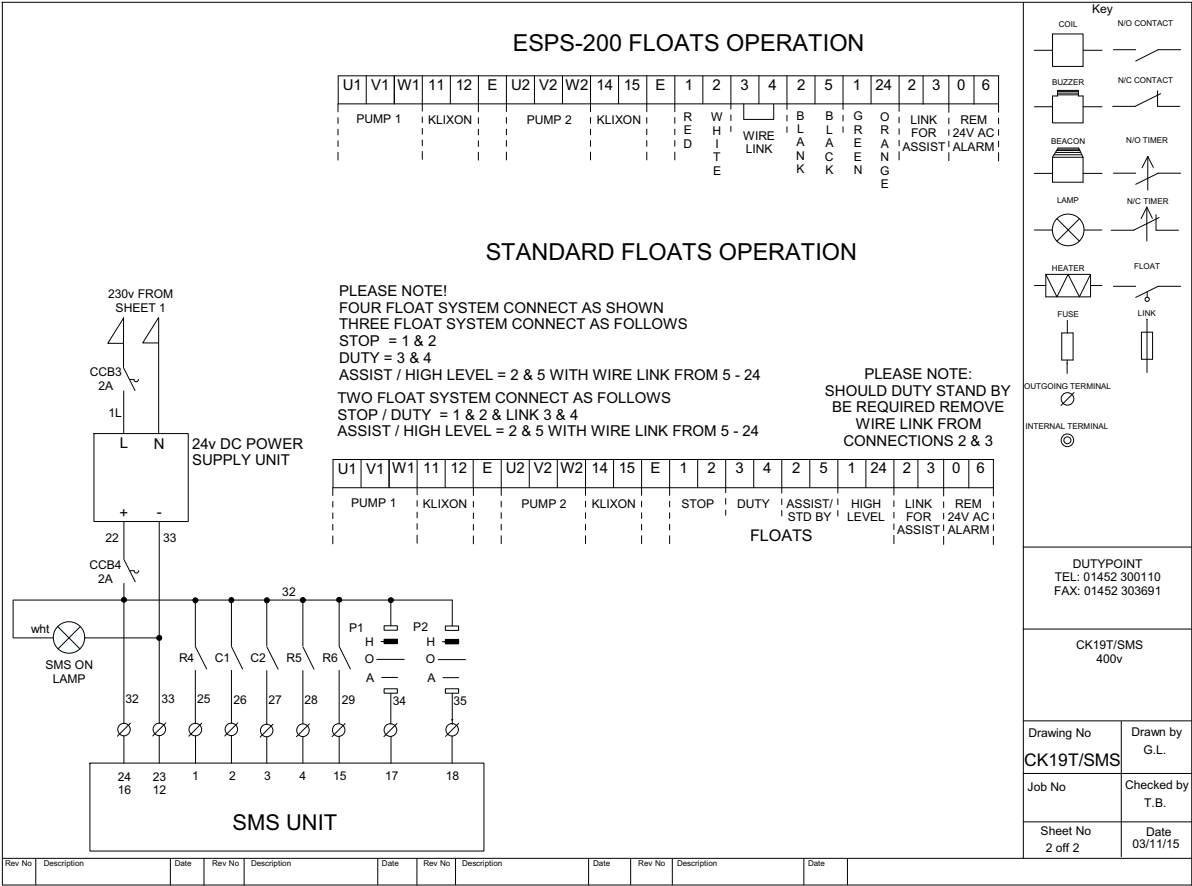
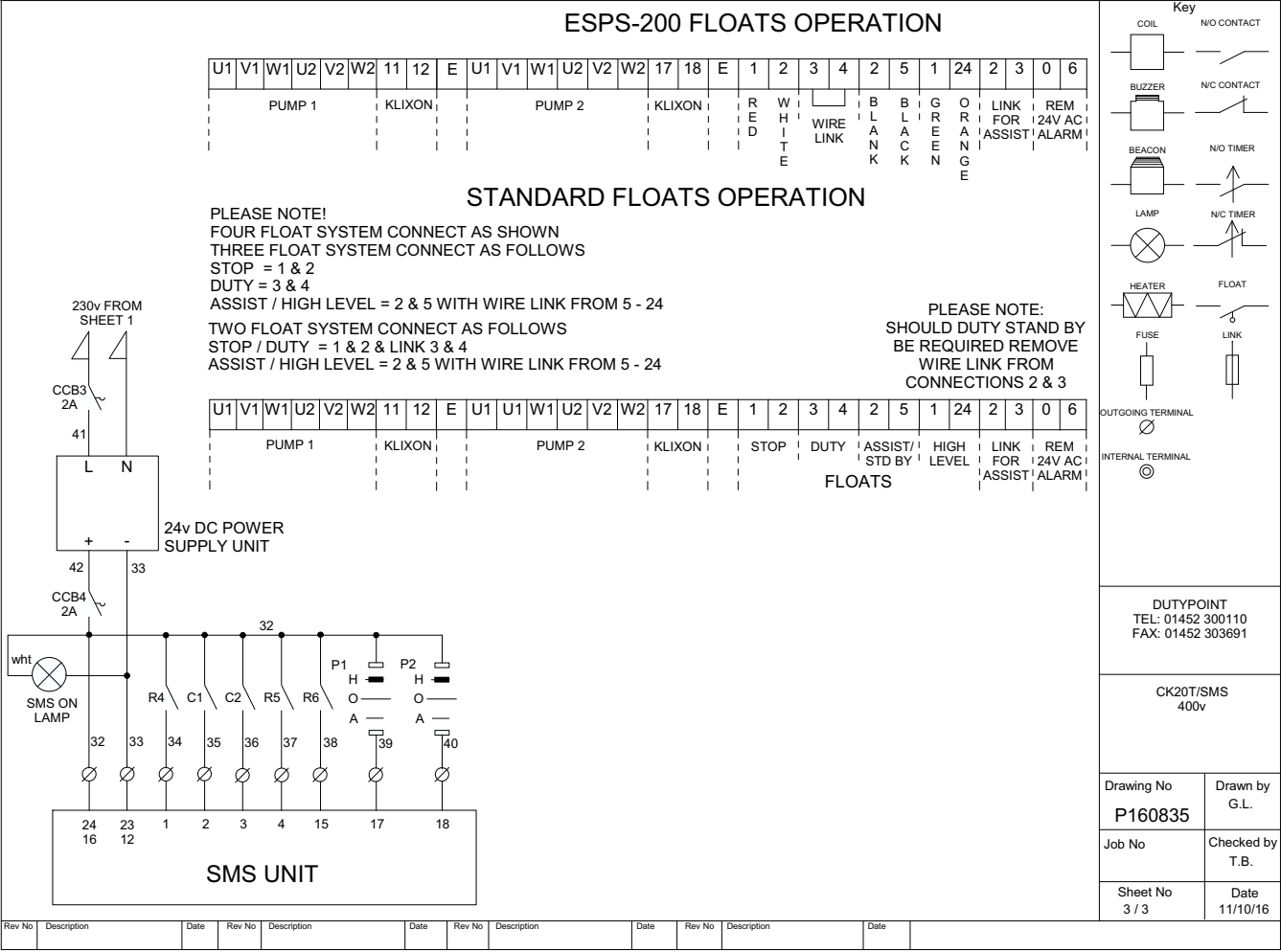


Figure 7.27: CK20T PRO Wiring Diagram Sheet 3 of 3



8. Dutypoint Standard Warranty

Your Dutypoint Systems standard product warranty is valid for a period of 12 months from date of delivery. The full terms and conditions are on the reverse of this certificate.

If you need to contact us regarding your warranty or any issue regarding your Dutypoint product, please contact our service department:

- Tel: +44(0)1452300590
- Email: service@dutypoint.com

Once your standard product warranty has expired, you may wish to take out our infinity service contract for an extended amount of cover. For more information visit our website: www.dutypoint.com/infinity

8.1 Terms and Conditions

- 1) The Company warrants that on delivery, and for a period of 12 months from the date of delivery, or such longer period as agreed by the Company in writing, (Warranty Period), the Goods shall:
 - a) conform in all material respects with their description as set out in the Agreement;
 - b) be free from material defects in design, material and workmanship; and
 - c) be of satisfactory quality (within the meaning of the Sale of Goods Act 1979).
- 2) Subject to Clause 3, if:
 - a) the Customer gives notice in writing to the Company during the Warranty Period within a reasonable time of discovery that some or all of the Goods do not comply with the warranty set out in Clause 1; and
 - b) the Company is given a reasonable opportunity to examine such Goods; and
 - c) the Customer (if asked to do so by the Company) returns such Goods to the Company's place of business, the Company shall, at its option, repair or replace the defective Goods, or refund the price of the defective Goods in full.
- 3) The Company shall not be liable for the failure of the Goods to comply with the warranty set out in Clause 1 in any of the following events:
 - a) the Customer makes any further use of such Goods after giving notice in accordance with Clause 2;
 - b) the defect arises because the Customer failed to follow the Company's oral or written instructions as to the storage, commissioning, installation, use and maintenance of the Goods or (if there are none) good trade practice regarding the same;
 - c) the defect arises as a result of the Company following any drawing, design or Specification supplied by the Customer;
 - d) the Customer alters or repairs such Goods without the written consent of the Company;
 - e) the defect arises as a result of fair wear and tear, wilful damage, negligence, or abnormal storage or working conditions; or
 - f) the defect arises as a result of the Customer's negligence or the Customer's breach of the Agreement.
- 4) Clause is the Customer's sole remedy in respect of the matters described therein.
- 5) The terms implied by sections 13 to 15 of the Sale of Goods Act 1979 are, to the fullest extent permitted by law, excluded from the Agreement.
- 6) The terms and conditions of the Agreement apply to any repaired or replacement Goods supplied by the Company.



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