

Spill Containment

Bund Water Control Unit - Installation, Operation & Maintenance

(MAN-3500 Issue 4c, Dec.2006)
(Code 024S & 024D Control & 031 Probe)

General

The unit is designed to remove rainwater from bunded areas enabling their designed retainment capacity, for oil spillages to be maintained.

Equipment

The Bund Water Control is supplied as a single unit (024S) or dual (024D), together with one or two probe unit/s (Code: 031), submersible pump/s, discharge hose/s and anti-syphon device/s.

Control Units

1) The Interactive DeadStop

This unique facility offers a fail-safe circuit for the pump, thus preventing the possibility of inadvertent oil removal due to any possible mis-operation or circuit failure. It comprises of an independent electronic circuit that utilises the fourth (red) Probe, within the Probe Unit, to constantly monitor for water presence above the pump inlet. Should this circuit detect the NON-PRESENCE of water in this area it will, if the appropriate link is installed, automatically prevent power being applied to the pump. LED's are incorporated to display the condition and operation of this DEADSTOP facility.

2) Alarm Facilities (Outputs)

Alarms are displayed by means of LED's on the printed circuit board and operate 'clean contact' relays for output connection to remote alarms or telemetry systems. The alarm relay outputs are as follows: Power Failure • High Oil • High Water/Pump Failure. These can be either output individually or joined via an 'option link' on the PCB to give a COMMON Alarm output. Two further outputs are available if required, Float Switch Activated and Pump Called For.

3) USER Optional PUMP cut-off (from any alarm condition)

This will automatically disable the pump should an alarm condition arise. However it will automatically re-enable the pumps should the alarm condition reset.

4) Non-polarising pump control circuit (prevents probe oxidation.)

Low voltage Alternating Current is supplied to the Pump start probe/s and DeadStop probe. This prevents the probe/s polarising due to any electrolysis action that may occur over a period and help prevent any debris build up on the probe tips due to this.

5) In-built push button test for pump/s.

A push button switch is fitted as standard on the PCB for test and maintenance use to momentarily operate the pump relay, enabling the user to verify the Control circuit operation without the necessity of filling the sump with water etc.

6) Operation Counter

A pump operation counter is included within the control unit to log the number of pump operations. This counter cannot be manually reset.

7) ISOLATOR fitted as standard (RCBO can be fitted instead if requested)

A Mains isolator is fitted within the control offering local isolation of the control for maintenance / repair purposes.

8) Easy access Pump Fuse

A pump fuse is incorporated in the terminal output for ease of access.

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Probe Units

1) Ease of Installation (All Units)

The Probe unit (Code 031) requires no fixings and can simply be lowered into the sump. The unit also incorporates a pump stand with locating brackets for the pump. This keeps it above the sump floor, helping prevent small stones, grit etc. from entering the pump inlet and automatically places the pump in the correct position in relation to the probes.

2) Deep Sump, Shallow Sump, No Sump or Dump Tank Operation (code 031)

Each probe sensor is colour coded and can be cut/set to the correct length to suit sump/site requirements. Because the Probe Unit is attached to the Pump Stand, the datum point for the probe heights can be taken from the Pump Inlet. This allows for accurate control of the water level where only a small Start/Stop range is possible.

3) Anti-Syphon Device

An in-line anti-syphon device is supplied with each probe unit and pump to prevent inadvertent syphoning of oil after a major spillage.

Installation -

NOTE: If an 024S or 024D Installation Kit has been purchased, then read instructions provided within Kit before proceeding.

- a) The backing plate containing the PCB, pump counter and Din Rail connectors should be removed as a complete assembly from control cabinet in order to facilitate drilling the required cable entry points. This can be achieved by simply removing the 4 retaining nuts and washers.
- b) Determine the number and size of the cable entry points and the gland types and sizes required for this installation and using the template provided, carefully drill the base of the enclosure.
- c) Clean out the enclosure before replacing backing plate etc. and securing it with the 4 nuts and washers previously removed.
- d) If the unit is to be installed on a Unibund, fit the hanging brackets to the rear of the enclosure.
- e) The Control Unit should be mounted on the outside surface of the bund wall, within 5 metres of the sump. (Note: A 5 metre length of cable is attached and sealed as standard, to the pump and probe. If a longer length is required, then this must be specified with order). Mains (115/230 VAC – Input voltage specified on individual unit), Pump, Probe and Telemetry cables should be fed into the unit via the entry points previously drilled using the appropriate cable glands. Connection to the terminals within the control is listed in table 1.
- f) The probe sensors within the Probe Unit should be cut to the required length. Each sensor is colour coded for your convenience - YELLOW = Pump Start, BLUE = Pump Stop, RED = DeadStop & BLACK = Common. (Note: The colours of the sensors correspond to the colours of the signal wires exiting the Probe Unit). The insulation should then be cut back, approximately 20mm, from the end of each probe. The Probe Unit can then be connected to the Pump outlet and secured via the clamping bracket. The hose tail, hose, anti-syphon device and lifting chain/rope should be connected before lowering the unit into the sump. Note: The anti-syphon device must be connected into the hose in order that its position is approximately 6 inches (150mm) below the top of the inner side of the bund wall. The hose should then be fed over the wall to an appropriate drain or soak-away. The lifting chain/rope should be anchored in an accessible position for easy retrieval should the pump and probe unit need to be removed at a later date for maintenance or repair. The pump and probe cables should then be fed back to the control unit.

Operation

The sensors within the Probe unit will continually monitor the level of liquid within the sump. If the liquid is water, then when it reaches a pre-determined 'high level' (Start Probe), the pump will be activated reducing the level until a pre-set minimum 'low level' (Stop Probe) is reached, which will automatically stop the pump. If the liquid is oil, then a 'high oil' alarm will be generated when the depth of oil within the sump (on top of any water present) reaches the 'Oil Float Switch'.

A fail-safe circuit is incorporated within the system to remove power to the pump if oil is detected above the pump inlet (Link 5) or a High Oil/Liquid level is detected within the sump (Link 6), both of which are customer selectable via jumper links. Circuit failure being detected however is permanently wired. Please note: These links are set in the factory as follows: Link 6 - IN, Links 5 - IN. (Suggested setting). Unit operation and condition is displayed via LED's on the PCB, adjacent to which is a counter displaying the number of times the pump has been activated. All of which can be easily seen through the viewing panel.

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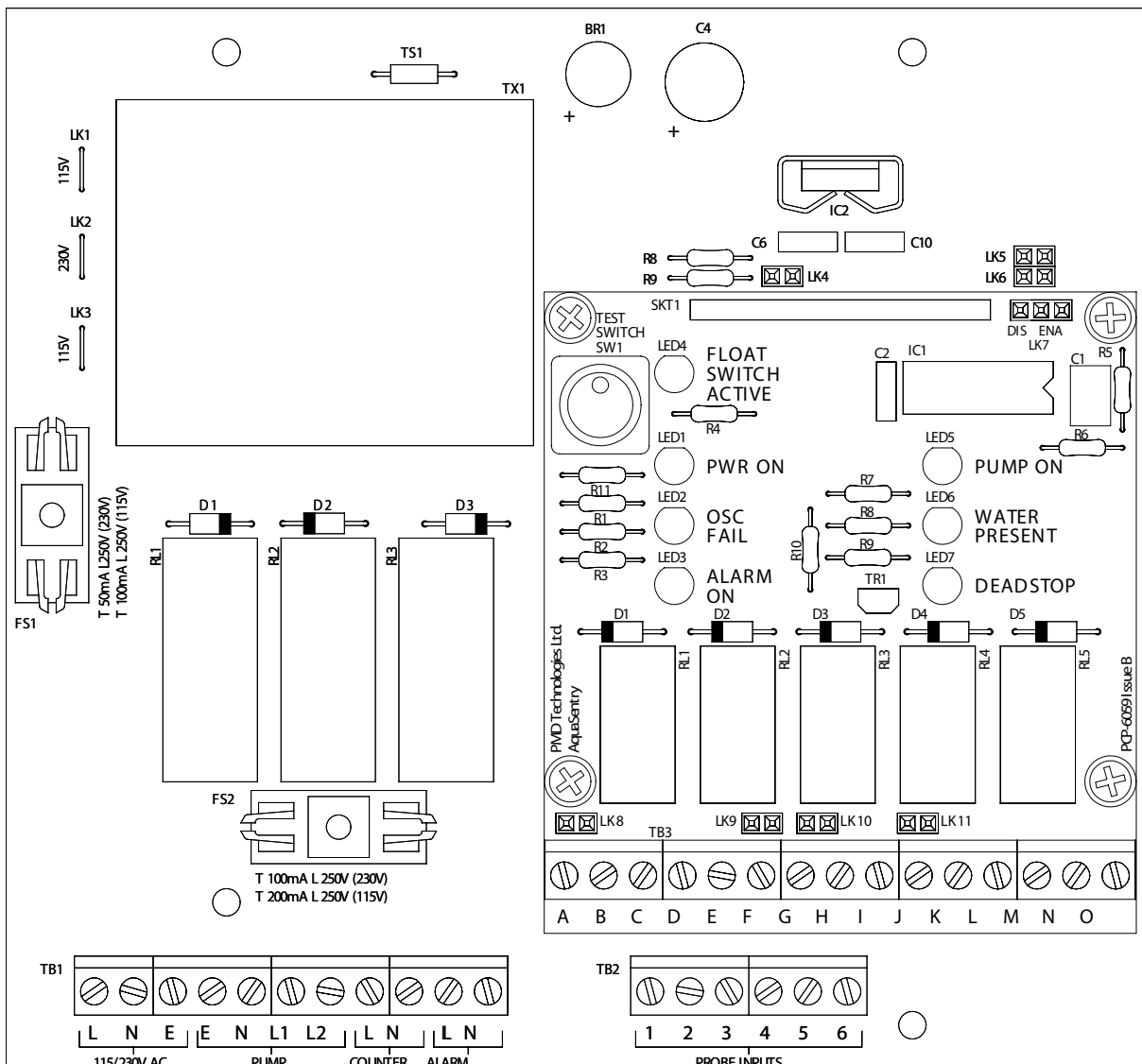
Alarm Outputs are available through clean contact relays within the unit outputting High Water, High Oil and Power Failure. These can be taken individually or commoned via 'jumper links' on the PCB (see table 2).

Alarm Output Timer – If selected, via Link LK7, this will delay a High Water alarm and activation of the DeadStop relay for approximately one hour and a High Oil alarm and DeadStop relay for approximately 20 seconds. (This option is selected as standard)

Beacon / Sounder Output – A 115/230 VAC (dependent on unit supplied) alarm output is available to operate a Beacon and/or Sounder. This will operate on any alarm condition detected.

Operational Output – A 'pump called for' clean contact relay output and a Float Switch Activated output are also available. Please Note: The unit is supplied with the alarms commoned i.e. Links 8,9,10 & 11 IN and the Alarm Output Timer (link LK7) set to the DISABLED position.

Note: All Terminals on TB1 with the exception of the Alarm Output (L N) are for reference only. They are all 240 VAC and are factory connected to Din Rail terminals. - Refer to Control Unit Layout



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Connection Detail

TB1 – Terminals listed for reference only

Terminal Labels (listed Left to Right)	Function	User or Factory Connected
L	Mains Input	Factory Connected to Din Rail
N	Mains Input	Factory Connected to Din Rail
E	Mains Input	Factory Connected to Din Rail
E	Pump Output	Factory Connected to Din Rail
N	Pump Output	Factory Connected to Din Rail
L1	Pump Output	Factory Connected to Din Rail
L2	Pump Output	Factory Connected to Din Rail
L	Pump Counter Output	Factory Connected to Din Rail
N	Pump Counter Output	Factory Connected to Din Rail
L	Beacon/Sounder Output	User Connected if Required
N	Beacon/Sounder Output	User Connected if Required

TB2 – Probe Unit Connections

Terminal No	Function	Wire Colour
1	Common Return	Black
2	Pump Start	Yellow
3	Pump Stop	Blue
4	DeadStop	Red
5	Float Switch (High Level)	White
6	Float Switch Return	Green

TB3 – Low Voltage (Clean Contact) Alarm Connections

Terminal ID	Relay Contacts (*with Power Applied)	Function
A	Common (C)	High Level Alarm
B	Normally Closed (NC)	High Level Alarm
C	Normally Open (NO)	High Level Alarm
D	Common (C)	Power Fail Alarm
E	Normally Closed (NC)*	Power Fail Alarm
F	Normally Open (NO)*	Power Fail Alarm
G	Common (C)	High Oil Alarm
H	Normally Closed (NC)	High Oil Alarm
I	Normally Open (NO)	High Oil Alarm
J	Common (C)	High Water Alarm
K	Normally Closed (NC)	High Water Alarm
L	Normally Open (NO)	High Water Alarm
M	Common (C)	Pump Called For
N	Normally Closed (NC)	Pump Called For
O	Normally Open (NO)	Pump Called For

Link Settings

Selectable Link	Function	Input (TB3)	Output (TB3)
LK7	Enables or Disables Alarm Timer	N/A	N/A
LK8 & LK9	IN to select Common Alarm	A	C
LK8, LK10 & LK11	IN to Common Input and give Individual Output (NGC)	A	F - I - L
LK8,LK9,LK10,LK11	All OUT for Individual Inputs & Individual Outputs	See TB3	See TB3
L4	Not Used – Must Leave OUT		
L5	IN to operate DeadStop from DeadStop Probe		
L6	IN to operate DeadStop on High Level Alarm		

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Bund Water Control Code 024 Service

It is recommended that the following inspection and Service procedure be carried out annually by a qualified person. (Sui Generis can offer a service package to suit your individual requirements - please phone 01206 798 798). If the site conditions are constantly dirty however, it is advisable to carry out service at more regular intervals.

Initial preparation:

- 1) Take note of LED pattern and pump counter readings within Control Unit before proceeding.
- 2) Isolate mains power in Control Unit.
- 3) Remove Probe Unit & Pump from sump and stand upright on bund floor.

Control Unit

- 4) Visually inspect all wires, harnesses, relay contacts, fuses, etc. for damage.
- 5) Check all terminal connections for tightness.
- 6) Check all cables and entry glands.

Note:

The only mechanical moving parts are the stainless steel hinge pins on the Control Cabinet lid. These can be lubricated occasionally if necessary using any standard lubricating oil.

Probe Unit (Code 031 & 033), Pump & Sump

- 7) Remove lower section of probe unit in order to expose probes.
- 8) Inspect and clean Probes & Float Switch assembly by washing/wiping down with soft brush or cloth.
- 9) Inspect and clean wires within the 'top section' of the probe unit. (Damage to insulation could result in 'electrical tracking' causing miss-operation). If the wires outer insulation is damaged, then clean area, allow to dry and insulate using a Conformal coating spray (Nonconductive lacquer). Replace top section cover.

Important Note: If Conformal coating is used care must be taken NOT to spray over the stainless steel probe tips.

- 10) Make sure all probes are straight and will not contact the inside of tubular cover when refitted.
- 11) Clean and visually check pump, hose, anti-syphon device, hose clips and cable.
- 12) Carry out the procedures as set out in the 'BWC Tests' (with water or without water)
- 13) Replace lower cover of probe unit
- 14) After satisfactory completion of the above, lower complete unit back into sump

Recommended Spares

Recommended spares for each individual unit:

Fuse - 5 amp Anti-Surge x 2 (Order Code - PCP-6401)

Fuse - 500 milliamp Anti-Surge x 1 (Order Code - PCP-6400)

Recommended spares for each 5 units:

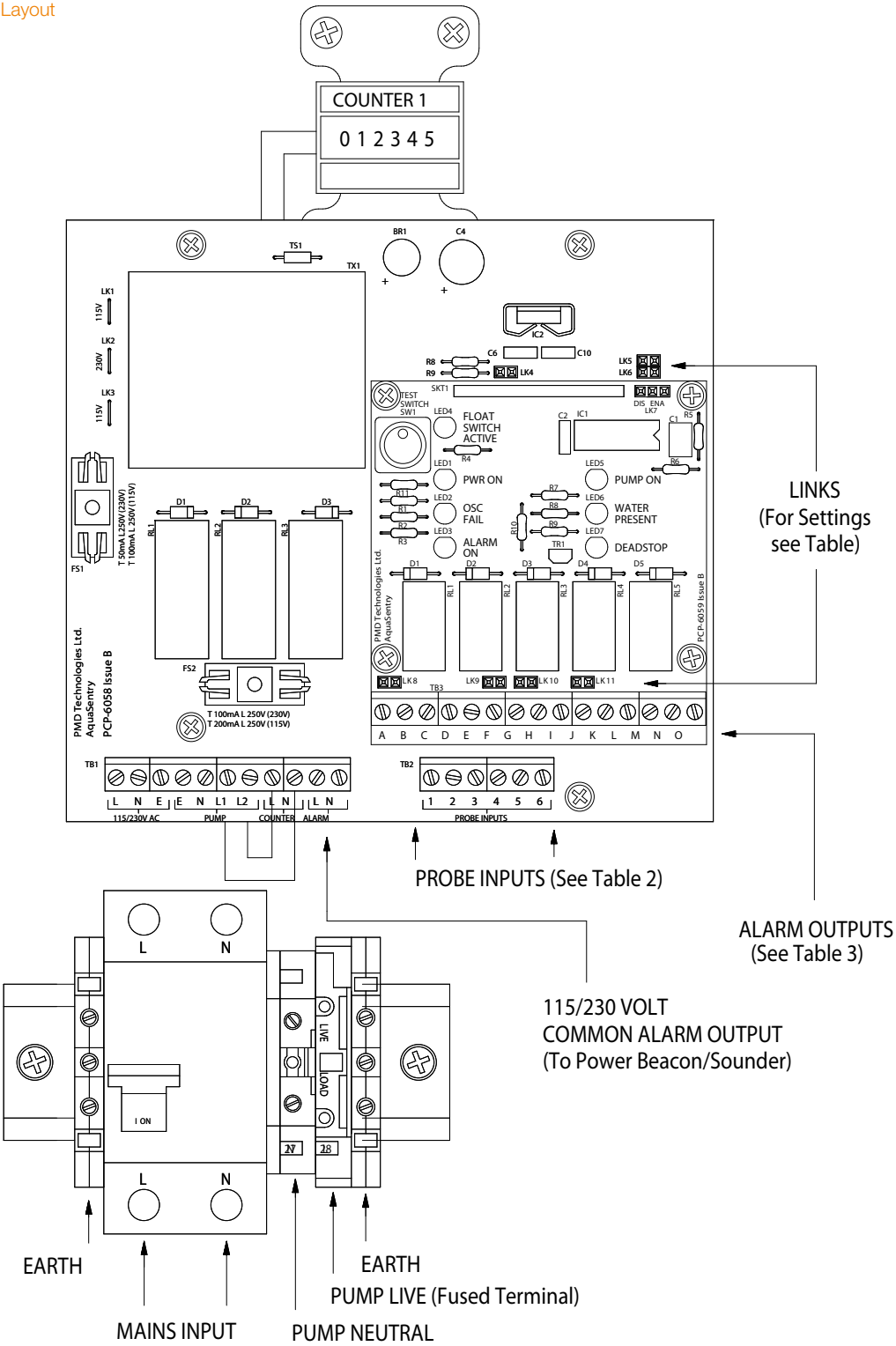
Submersible Pump x 1 (Order Code: GSA-1002)

Service Aids - Conformal Coating (Spray Can) (Order Code: GCT - 4208)

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024 S - Control Unit Layout
(on Backing Plate)

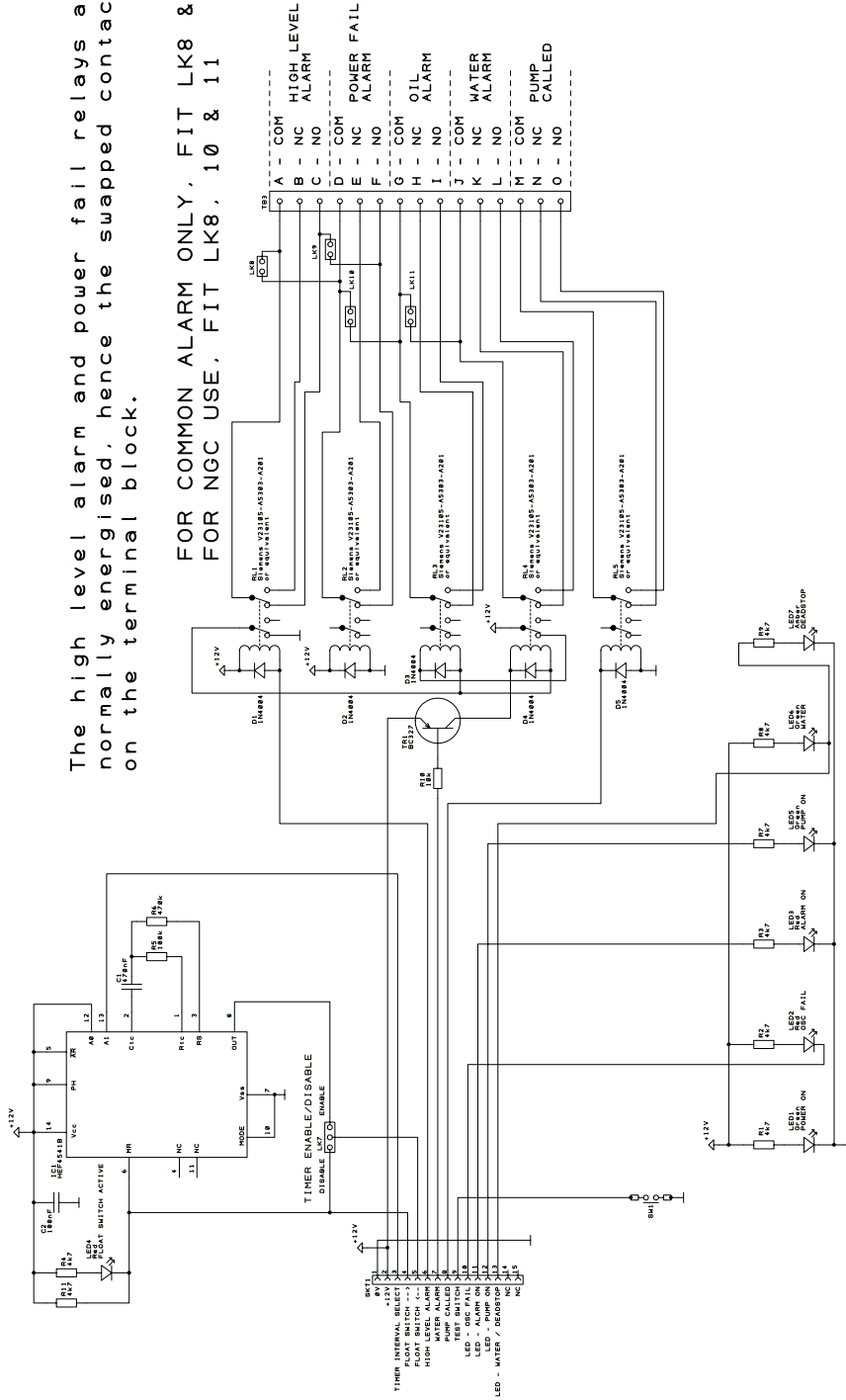


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The high level alarm and power fail relays are normally energised, hence the swapped contacts on the terminal block.

FOR COMMON ALARM ONLY, FIT LK8 & 9
FOR NC USE, FIT LK8, 10 & 11



		PMD Technologies Ltd.
		PCP-6059 BUND WATER CONTROL UNIT ALARM PCB
		DRAWN BY: Brian Logan
	SHEET 1 OF 1	PCP-6059 (Circuit Diagram) [REVISION B] 18 NOV 03

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