



AquaTech Pressmain

INSTRUCTIONS FOR

0. GENERAL SAFETY INFORMATION, WARNINGS & CAUTIONS
1. INSTALLATION
2. THE USER
3. DISPOSAL

LEVEL SWITCH LSM, LSM-P3 & LSM-TT-B









CE

ISSUE: 5 18/03/10

Head Office: AGM House, London Rd, Copford, Colchester, Essex. CO6 1GT UK
Tel: 01206 215121 Fax: 01206 215131

Manchester Office: Dolphin House, 130 Princess Road, Manchester M16 7BY
Tel: 0161 226 4727 Fax: 0161 226 5848

CONTENTS

	0.0 GENERAL SAFETY INFORMATION		3
0.1	 WARNINGS		3
0.2	 CAUTIONS FOR INSTALLATION		3
0.3	 CAUTIONS FOR OPERATION/USER		4
0.4	 CAUTIONS FOR MAINTENANCE		4
	GENERAL		5
	PRODUCT IDENTIFICATION		5
1.	INSTALLATION INSTRUCTIONS		6
1.1	GENERAL		6
1.2	ADDITIONAL WARNINGS & CAUTIONS		6
1.3	PROCEDURE		6
1.3.1	LOCATION		6
1.3.2	FIXING		6
1.3.3	ELECTRICAL		7
1.3.4	LIMITS OF OPERATION (standard equipment)		8
2.	USER INSTRUCTIONS		9
2.1	TYPICAL INSTALLATION EXAMPLES		9
2.2	DIL SWITCH SETTINGS		12
3.	DISPOSAL		12
	EC DECLARATION OF CONFORMITY		12



0.0 GENERAL SAFETY INFORMATION



- These instructions are intended for the installer/operator/user/maintenance of this equipment and must be kept with the equipment, for the life of the equipment and made available to all persons. Please read GENERAL SAFETY INFORMATION 0.0, WARNINGS 0.1 and CAUTIONS 0.2, 0.3 & 0.4 before doing anything else, and then follow them carefully.
- The unit must only be installed/operated/used/maintained by a competent person; *A competent person is someone who is technically competent and familiar with safety practices and the hazards involved.*
- Failure to install/operate/use/maintain the equipment as recommended below could cause damage to the equipment any anything subsequently connected to it, and invalidate the warranty provided by AquaTech-Pressmain to the buyer.
- Any damage caused to the equipment by misapplication, mishandling or misuse could lead to risk of **Electrocution, Burns, Fire, Flooding or injury to people or property** dependent upon the circumstances involved.
- This equipment automatically restarts after a power interruption.
- We accept no responsibility or liability for any consequences or damage/losses due to misapplication, mishandling or misuse of the equipment.
- The latest version of this instruction manual with up to date safety information can be downloaded from our website at www.aquatechpressmain.co.uk

0.1



WARNINGS

- 0.1.1 **Do not touch any live parts for at least 5 minutes after switching off the electricity supply. Failure to observe this will constitute a severe Electric shock and/or Burns hazard and may be lethal.**
- 0.1.2 **The equipment is only suitable for earth referenced supplies and must be permanently earthed to avoid Electric shock hazard.**
- 0.1.3 **With equipment isolator OFF, mains voltage may still be present from BMS system. This constitutes an Electric shock hazard.**
- 0.1.4 **Some equipment is designed to operate with liquid temperatures up to 150 degrees centigrade and will constitute a Burns/scalding hazard.**
- 0.1.5 **The equipment must not be pressurised beyond the maximum working pressure as stated otherwise serious mechanical damage/destruction could occur causing injury to people or property.**
- 0.1.6 **The equipment must not be heated/chilled beyond the maximum/minimum working temperature as otherwise serious mechanical damage/destruction could occur causing injury to people or property.**
- 0.1.7 **Any damage to equipment caused by misapplication, mishandling or misuse could lead to Electric shock hazard, Burns hazard, Fire hazard, Flooding hazard or cause injury to people or property.**

0.2



CAUTIONS FOR INSTALLATION

- 0.2.1 READ GENERAL SAFETY INFORMATION 0.0, WARNINGS 0.1 and CAUTIONS 0.2, 0.3 & 0.4
- 0.2.2 The unit should only be installed/operated by a competent person; *A competent person is someone who is technically competent and familiar with safety practices and the hazards involved.*
- 0.2.3 Store in a dry place to avoid damp conditions deteriorating the equipment.
- 0.2.4 Protect against dirt, damage and frost. Frost/freezing will damage components.

- 0.2.5 The equipment is only suitable for installation in a clean, dust free indoor environment, with adequate protection from heat and frost. Ambient air temperature should be between 5 and 40 degrees centigrade, non-condensating. Operation outside of these conditions could seriously damage the equipment.
- 0.2.6 Ensure the electrical supply is the correct voltage, current, frequency and type for the equipment supplied and that suitable circuit protection equipment is installed in the supply. Incorrect electrical installation could be an electric shock/burns/fire hazard.
- 0.2.7 When accessing the control panel to make electrical connections adopt anti-static procedures e.g. wear anti-static earthed wristband, to avoid risk of damaging the controller.
- 0.2.8 Do not operate this equipment prior to commissioning. This could cause irreparable damage to equipment/pumpset/pipework/system components.
- 0.2.9 Isolate the equipment before pressure testing system. Excess pressure could cause irreparable damage.
- 0.2.10 When chlorination of the system is carried out, ensure that any residual chlorine is removed by thorough flushing as detailed in the HSE approved code of practice L8, to avoid damaging the equipment/pumpset. The normal level of chlorination is up to 2 parts per million (ppm), but shock dosing for sterilization purposes, at 25-50 ppm for 24-48 hours is acceptable as long as all chlorine is removed once the process is complete. Chlorination beyond these limits could seriously damage pumpset components and WILL NOT be covered by the warranty.
- 0.2.11 The installer/user is responsible for the installation of the correct earthing and protection according to valid national and local standards. All operations must be carried out by a suitably qualified person.
- 0.2.12 The equipment is only suitable for earth referenced supplies and must be permanently earthed to avoid electric shock hazard.
- 0.2.13 The equipment must be permanently earthed with appropriate sized Earthing.
- 0.2.14 Never perform high voltage resistance tests on control panels without first disconnecting the panel from the circuit being tested as this will damage the built in electronic components.



0.3 CAUTIONS FOR OPERATION/USER

- 0.3.1 READ GENERAL SAFETY INFORMATION 0.0, WARNINGS 0.1 and CAUTIONS 0.2, 0.3 & 0.4
- 0.3.2 The unit should only be operated/used by a competent person; *A competent person is someone who is technically competent and familiar with safety practices and the hazards involved.*
- 0.3.3 The Owner/User of this equipment has a Legal Responsibility to ensure that it is subject to regular formal inspections.
- 0.3.4 The equipment must not be run until commissioned by an authorised AquaTech-Pressmain agent, this could cause irreparable damage.
- 0.3.5 The equipment should be left switched ON for normal operation.
- 0.3.6 Portable telephones or other electro-magnetic equipment must not be used near the set to avoid corruption of program and unpredictable operation of unit.



0.4 CAUTIONS FOR MAINTENANCE

- 0.4.1 READ GENERAL SAFETY INFORMATION 0.0, WARNINGS 0.1 and CAUTIONS 0.2, 0.3 & 0.4
- 0.4.2 The unit should only be operated/maintained by a competent person; *A competent person is someone who is technically competent and familiar with safety practices and the hazards involved.*
- 0.4.3 Where the equipment is fitted with Building Management Services (BMS) interconnections, notify the appropriate persons before switching OFF for maintenance or adjustments, to avoid unnecessary alarm conditions occurring. WARNING: With isolator OFF, mains voltage may still be present from BMS system. This constitutes an Electric shock hazard.
- 0.4.4 Switch OFF equipment before accessing control panel.

GENERAL DESCRIPTION

The LSM Range units offer an easy solution to many water level control and alarm functions. They can be used either with conductive probes in suitable conductive fluids or, with float switches in non conductive fluids.

They have been used for emptying, filling, or level warnings within storage tanks (i.e. low or high level) amongst many other applications, of which, some are shown within this instruction manual.

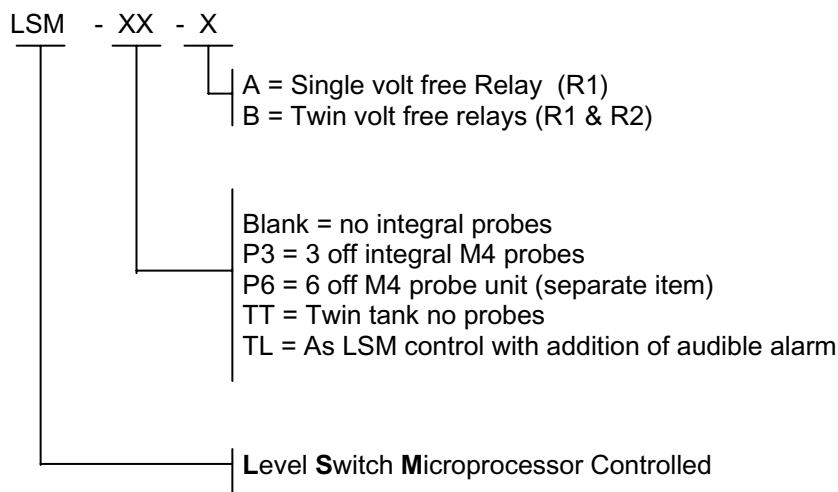
The LSM-P series come assembled with sleeved 4mm diameter 303 stainless steel probes, at a length of 1 metre, which can be cut to suit most tanks.

In applications where it is not possible to make use of the integral probes, model LSM is available, allowing wall mounting of the unit remote from the tank/pit and using up to 4 remote probes which can be up to 15 metres from the control unit.

Units are supplied in a weatherproof case to IP55 Standard BS5490 (1977) with two glands, which accept cables from 6 to 8 mm in diameter, other sizes on request.

Supply voltage: Standard 240V AC 50HZ 1Ø, from an isolating switch and 2 Amp fuse - NOT SUPPLIED.

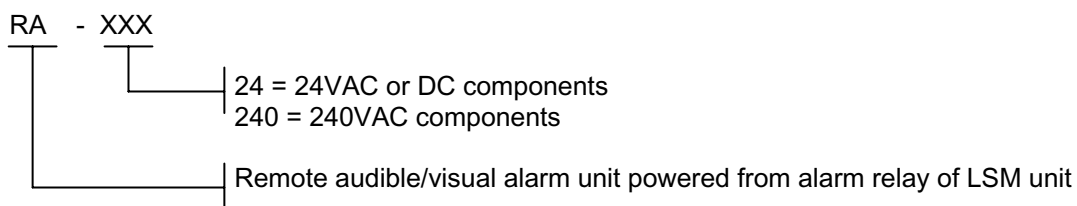
PRODUCT IDENTIFICATION



example of a LSM unit (no integral probes)



RA240 remote audible/visual alarm



1. INSTALLATION INSTRUCTIONS

FOR LIQUID LEVEL SWITCH LSM, LSM-P3 & LSM-TT-B

1.1 GENERAL

These instructions are intended for the installer of this level switch. Please follow them carefully. Failure to install the equipment as recommended below could invalidate the warranty.

1.2 ADDITIONAL WARNINGS & CAUTIONS

1.2.1 READ GENERAL SAFETY INFORMATION 0.0, WARNINGS 0.1 and CAUTIONS 0.2, 0.3 & 0.4

1.2.2 Units fitted with a 1/2" BSP parallel thread (LSM-P3) must not be installed into a taper thread fitting otherwise the equipment will be damaged causing mechanical failure.

1.2.3 Pressure imposed on sensing probes must not exceed 1.0 Bar otherwise the equipment will be damaged causing mechanical failure.

1.3 PROCEDURE

1.3.1 LOCATION

The level switch LSM is for wall mounting with brackets provided using separate probe unit/float switches.

The level switch LSM-P3 can be installed through the tanks lid.

Ensure that the location provides adequate clear space for reasonable access to all parts. There must be sufficient room to:-

- open control box lid;
- withdraw level switch from tank.

1.3.2 FIXING

To install the level switch LSM-P3 in a tank lid either: -

- a) drill a 20mm diameter clearance hole and use the back nut and washer provided, to ensure water tight seal, or
- b) install in a 1/2" BSP parallel thread and ensure a water tight seal.

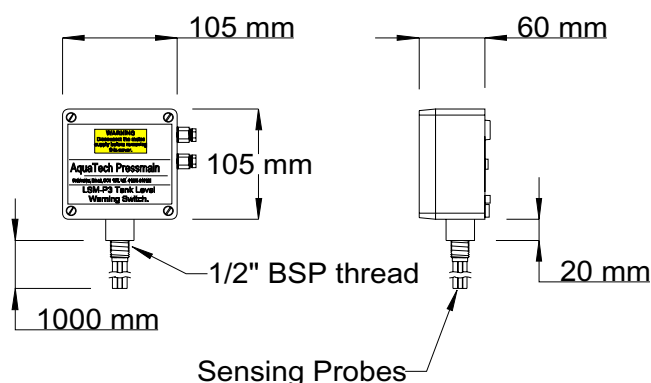


Fig 1. Mechanical detail of Level switch LSM-P3

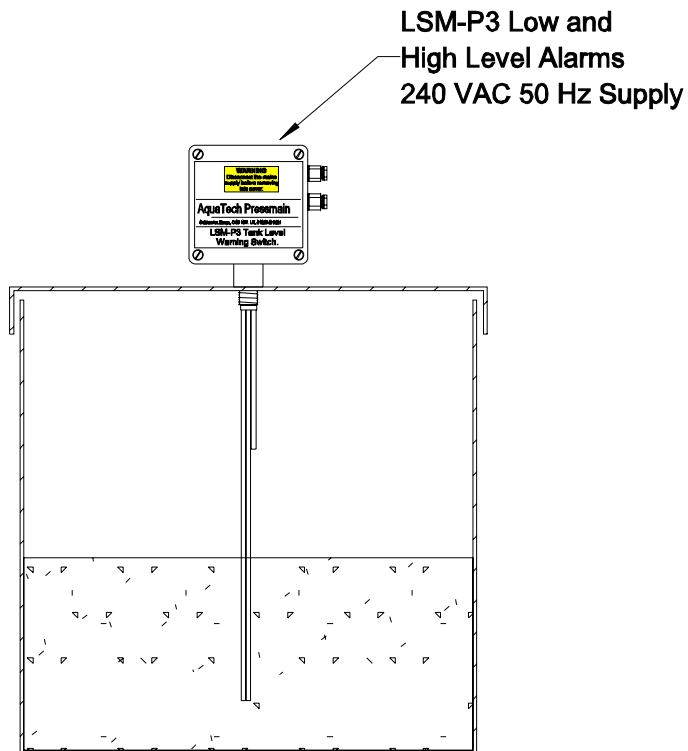


Fig 2. Typical installation example for Level Switch LSM-P3.

1.3.3 ELECTRICAL

- 1.3.3.1 READ GENERAL SAFETY INFORMATION 0.0, WARNINGS 0.1 and CAUTIONS 0.2, 0.3 & 0.4
- 1.3.3.2 All wiring must comply with the latest edition of local wiring regulations.
- 1.3.3.3 **Wear anti-static wrist strap at all times** to avoid static discharge causing problems with the built in electronic program.
- 1.3.3.4 Connect incoming electrical mains supply to identified terminals in control box (see fig. 3). Ensure voltages and frequency indicated on the labels correspond with supply mains data and that the supply fuse ratings are correct for the total current rating of the equipment.
- 1.3.3.5 Connect volt free relay terminals as required. (see fig 3).

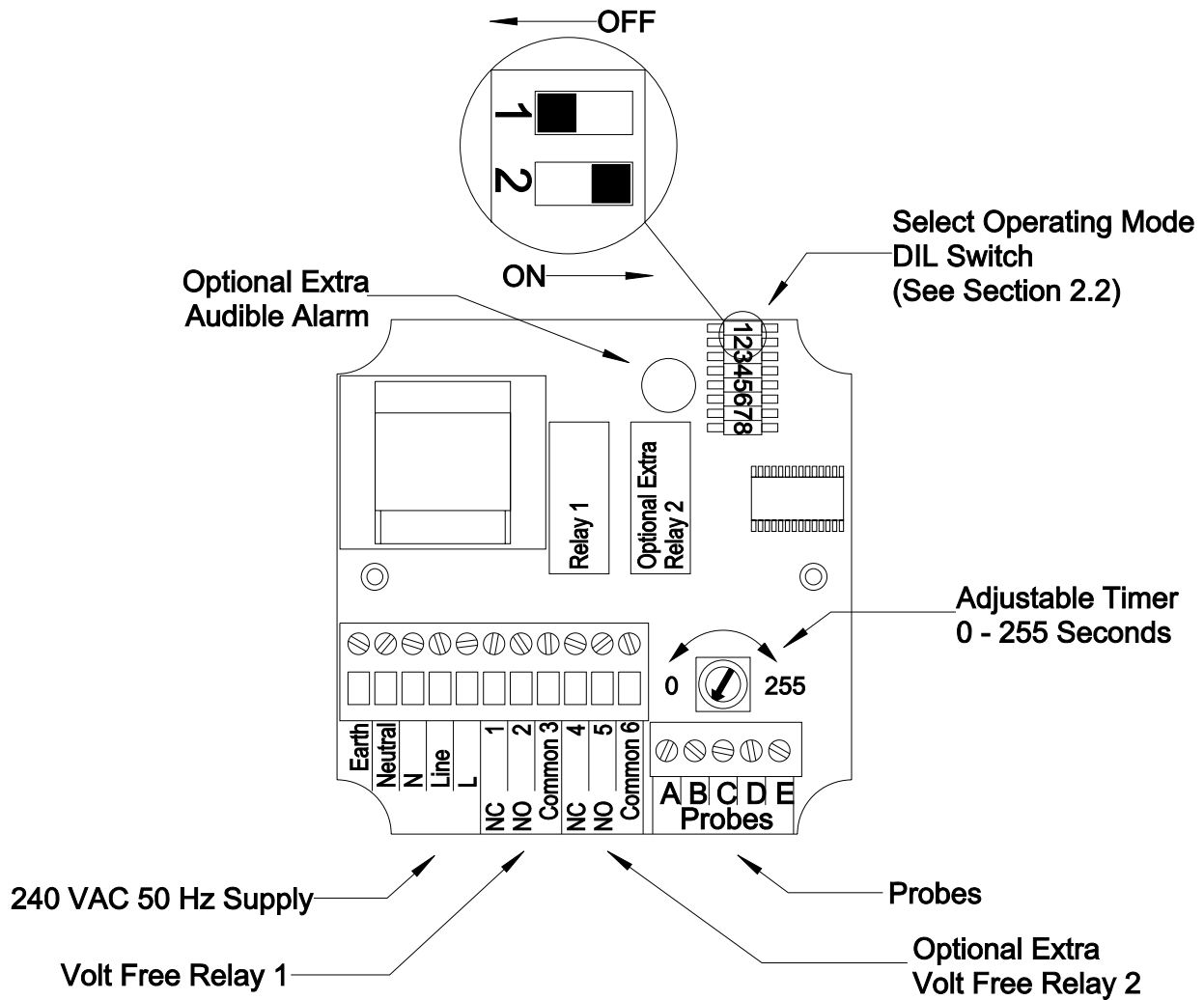


fig. 3. LSM level switch circuit board layout showing power supply, volt free relay and probe connections, plus location of DIL switches and adjustable timer.

Probe Letter	Probe Function
A	Only used for Relay 1 functions when switching between two levels
B	Relay 1 functions
C	Only used for Relay 2 functions when switching between two levels
D	Relay 2 functions
E	Common earth Reference

1.3.4 LIMITS OF OPERATION (standard equipment).

- Normal electrical supply 240VAC, 1 phase 50Hz, (other voltages available on request).
- Minimum conductivity 15uS.
- Maximum cable length to remote probes/switches is 50m using unscreened 0.75 mm 3 core cable.
- Maximum water temp 40°C.
- Ambient temp 5° to 40°C.
- Volt free contacts rated at 240VAC 2A AC1 maximum, 12V 100mA minimum.
- Maximum probe length 1 metre.
- Maximum pressure imposed on probes is 1.0 bar gauge.
- Minimum pressure imposed on probes is 0.0 bar gauge.

Special equipment may be supplied for use beyond these limits by prior agreement with AquaTech-Pressmain

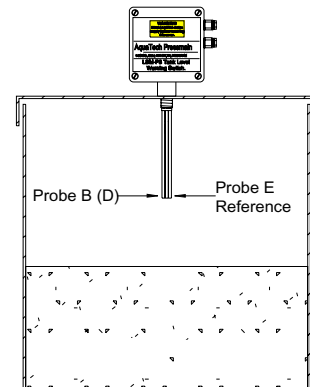
2. USER INSTRUCTIONS

2.1 TYPICAL INSTALLATION EXAMPLES

The following drawings illustrate typical examples of applications and installations using Relay 1 only. For Relay 2 use, substitute probe connections (C & D) and switch numbers (5, 6 & 7) as appropriate.

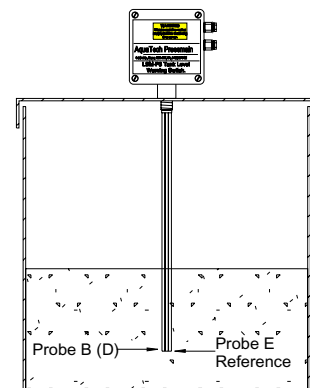
LSM-P3-A: High tank level alarm or Emptying a sump, controlled by 2 probes and a timer: -

1. Cut the correct probes to required length.
2. remove 25mm of insulation from end of probes.
3. set DIL switches/timer as required, see section 2.2
4. e.g. for high level alarm: to energise relay 1 (with sounding of audible alarm where fitted) when water touches probes, set all DIL switches to OFF except switch 2 which is set to ON (Relay 1 delay off). Set timer to maximum (fully clockwise = 255 seconds).



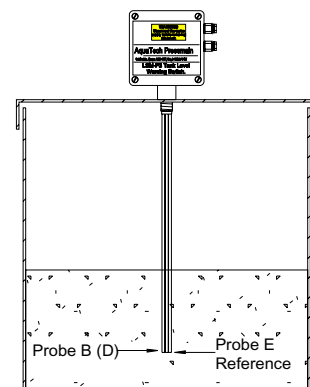
LSM-P3-A: Low tank level protection of pumps with fail safe relay operation by 2 probes and a timer: -

1. cut the correct probes to required length.
2. remove 25mm of insulation from end of probes.
3. set DIL switches/timer as required, see section 2.2
4. e.g. for level protection of pumps with fail safe relay operation: to energise relay 1 when water touches probes, set all DIL switches to OFF (Relay 1 delay on). Set timer to 30 seconds to delay pumps restarting.



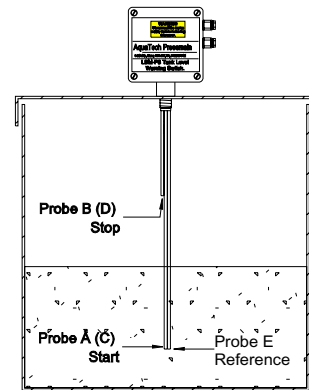
LSM-P3-A: Low tank level alarm or Filling a tank, controlled by 2 probes and a timer: -

1. cut the correct probes to required length.
2. remove 25mm of insulation from end of probes.
3. set DIL switches/timer as required, see section 2.2
4. e.g. for low level alarm: to energise relay 1 (with sounding of audible alarm where fitted) when probes become dry, set all DIL switches to OFF except switches 1 & 2 which are set to ON (Relay 1 delay off). Set timer to maximum (fully clockwise = 255 seconds).



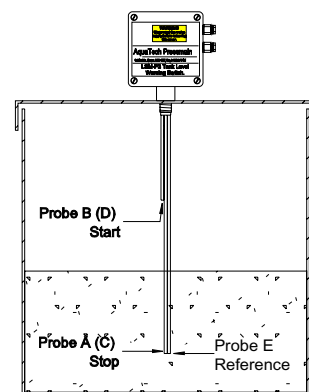
LSM-P3-A: Filling a tank between two levels, using 3 probes and no timer: -

1. cut the correct probes to required length.
2. remove 25mm of insulation from end of probes.
3. set DIL switches as required, see section 2.2
4. e.g. for filling a tank between two levels (start probe “A” and stop probe “B”): to energise relay 1 when start probe becomes dry and release relay 1 when stop probe becomes wet, set all DIL switches to OFF except switch 3 which is set to ON. Set timer to 0 seconds (Fully Anticlockwise).



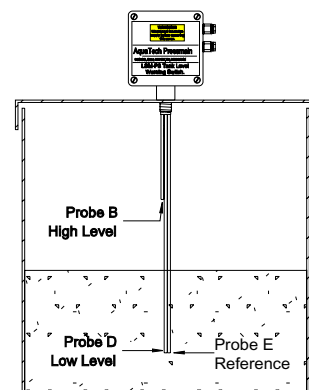
LSM-P3-A: Emptying a tank between two levels, using 3 probes and no timer: -

1. cut the correct probes to required length.
2. remove 25mm of insulation from end of probes.
3. set DIL switches as required, see section 2.2
4. e.g. for emptying a tank between two levels (start probe “B” and stop probe “A”): to energise relay 1 when start probe becomes wet and release relay 1 when stop probe becomes dry, set all DIL switches to OFF except switches 1 & 3 which are set to ON. Set timer to 0 seconds (Fully Anticlockwise).



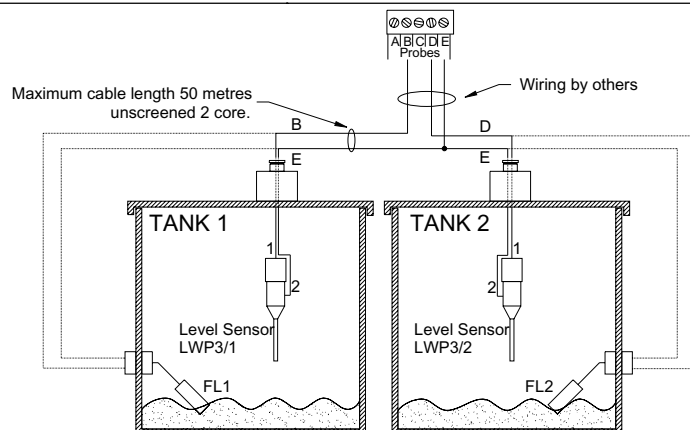
LSM-P3-B: Low and High tank level alarms with separate volt free output for each, using 3 probes and a timer: -

1. cut the correct probes to required length.
2. remove 25mm of insulation from end of probes
3. set DIL switches as required, see section 2.2
4. e.g. for high and low level alarm: to energise relay 1 when probe “B” becomes wet (high level alarm) and relay 2 when probe “D” becomes dry (low level alarm), set all DIL switches to OFF except switches 2, 5 & 6 which are set to ON. To activate audible alarm (where fitted) at high level, set switch 4 OFF, alternatively to activate audible alarm (where fitted) at low level, set switch 4 ON.



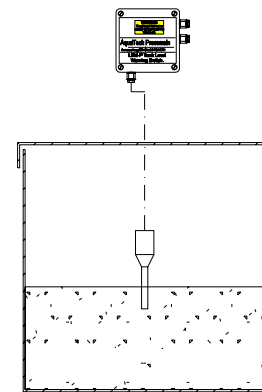
LSM-TT-B: Twin Tank Level alarm using optional LWP3 probes or level switches.

1. Install Level probes/switches as per instructions supplied with them.
2. set DIL switches as required, see section 2.2. For low water level alarm all DIL switches should be OFF.



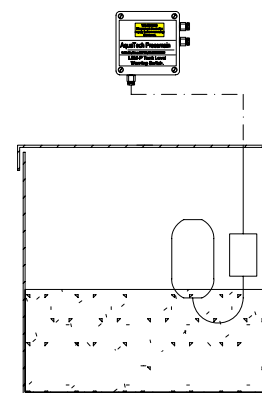
Filling/Emptying a tank or Low/High Level alarms controlled by LW3 probe & timer: Using LSM & one or two LW3 conductivity probes: -

1. fit probes to required length.
 2. connect probes to required terminals
 3. set DIL switches/timer as required, see section 2.2
- e.g. for filling a tank between two levels (start probe "A" and stop probe "B"): to energise relay 1 when start probe becomes dry and release relay 1 when stop probe becomes wet, set all DIL switches to OFF except switch 3 which is set to ON. Set timer to 0 seconds (Fully Anticlockwise).



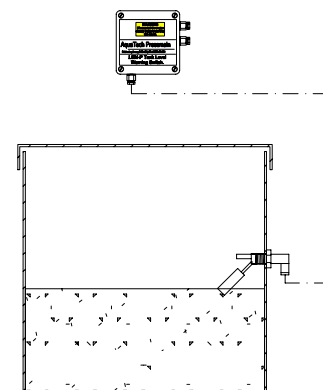
Filling/emptying a tank or Low/High Level alarms between one or two levels with a timer: Using LSM & MSF-100 float switches: -

1. fix weight to cable at required length.
 2. Wire float switches to required terminals
 3. set DIL switches as required, see section 2.2
- e.g. for emptying a tank between two levels (start probe "B" and stop probe "A"): to energise relay 1 when start probe becomes wet and release relay 1 when stop probe becomes dry, set all DIL switches to OFF except switches 1 & 3 which are set to ON. Set timer to 0 seconds (Fully Anticlockwise).



Filling/emptying a tank or Low/High level alarms using Stainless Steel float switches: Using LSM & one or two MSL-104 float switches: -

1. mount switches as required.
 2. wire switches to required terminals
 3. set DIL switches as required, see section 2.2
- e.g. for high and low level alarm: to energise relay 1 when probe "B" becomes wet (high level alarm) and relay 2 when probe "D" becomes dry (low level alarm), set all DIL switches to OFF except switches 2, 5 & 6 which are set to ON. To activate audible alarm (where fitted) at high level, set switch 4 OFF, alternatively to activate audible alarm (where fitted) at low level, set switch 4 ON.



2.2 DIL SWITCH SETTINGS

The following table is to illustrate the various options available for relay and timer operations, see also fig. 3: -

DIL switch number	Switch OFF : (pushed to the left)	Switch ON : (pushed to the right)
Switch 1: (at the top)	Relay 1 energised when probes E and B are wet.	Relay 1 energised when probes E and B are dry.
Switch 2:	Relay 1 energises after timer has expired. (delay on)	Relay 1 releases after timer has expired. (delay off)
Switch 3:	Set switch 3 to OFF to use 2 probes (E and B) with timer function.	Set switch 3 to ON to use 3 probes (E, A & B) without timer function.
Switch 4:	Audible alarm (optional extra) sounds when relay 1 operates.	Audible alarm (optional extra) sounds when relay 2 operates.
Switch 5:	Relay 2 (where fitted) energised when probes E and D are wet.	Relay 2 (where fitted) energised when probes E and D are dry.
Switch 6:	Relay 2 (where fitted) energises after timer has expired. (delay on)	Relay 2 (where fitted) releases after timer has expired. (delay off)
Switch 7:	Set switch 7 to OFF to use 2 probes (E and D) with timer function.	Set switch 7 to ON to use 3 probes (E, C & D) without timer function.
Switch 8: (at the bottom)	Low sensitivity for normal tap water.	High sensitivity for fluids with low conductivity (purer water).

3. DISPOSAL

Disposal of this product or parts of it must be carried out in accordance with the following guidelines:

Use the local public or private recycling/waste collection service.

In case such a recycling/waste collection service does not exist or cannot handle the materials used in this product, please deliver the product or any hazardous material from it to your nearest AquaTech-Pressmain office.

EC Declaration of Conformity

We, Aquatech-Pressmain Limited, declare this

LSM LIQUID LEVEL SWITCH

MODELS: LSM, LSM-P3 & LSM-TT-B

when installed and used in accordance with the instruction manual provided is in conformity with the following standards:

BS EN 60204-1:2006, BS 61000-6-1:2001, BS 61000-6-3:2001

following provisions of EEC Directives:

Low Voltage Directive 73/23/EEC and 93/68/EEC,

Electro Magnetic Compatability Directive 89/336/EEC with amendments 92/31/EEC.



12.11.04

I.D.Taylor, I.Eng.MIET. Director, **AquaTech-Pressmain Limited.**

AquaTech-Pressmain Limited

AGM House, London Rd, Copford, Colchester, Essex CO6 1GT UK

Telephone: 01206 215121 Fax: 01206 215131