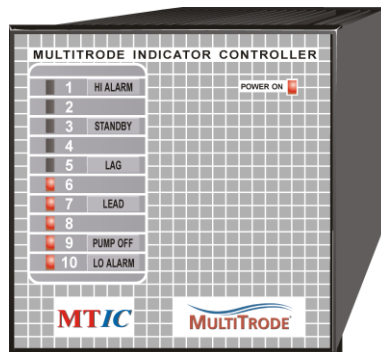


MultiTrode MTIC



Indicator Controller

MTIC – Indicator Controller

| | |
|--|--|
| Four Actuation Delays: | Used to average out wave action and for other control functions. |
| Method of Operation: | The MultiTrode MTIC liquid level monitoring and control system was developed to provide a solution for interfacing to building management systems and town water/sewerage systems. |
| The system can directly control operation of pumps and provide level indication at the site, as well as at up to four remote locations, using 0-10V DC or 4-20mA current loop. | |
| Until the advent of this MultiTrode system, these facilities had not been economically practical for hydraulic services in high-rise buildings. | |

MTIC Installation & Operation Manual

Revision 6.0

7 August 2013

MULTITRODE® and MULTISMART® are registered trademarks of MultiTrode Pty Ltd in Australia, USA, and Europe. PUMPVIEW® is a registered trademark of MultiTrode Pty Ltd in the USA and Australia. Designs registered for the MultiSmart Pump Controller Remote and Base Modules in Australia, USA, Europe and China. Patents pending in Australia, USA, and Europe.

©2013 MULTITRODE PTY LTD. THIS PUBLICATION IS PROTECTED BY COPYRIGHT. NO PART OF THIS PUBLICATION MAY BE REPRODUCED BY ANY PROCESS, ELECTRONIC OR OTHERWISE, WITHOUT THE EXPRESS WRITTEN PERMISSION OF MULTITRODE PTY LTD.

WARNINGS AND CAUTIONS

Information to User

Please read through the manual so you will know how to operate and obtain maximum performance from your product. After you have finished reading the manual, put it away in a safe place for future reference.



WARNING:

Do not use this unit in environments that may contain flammable/explosive or chemically aggressive gases or powders.

Contents

| | | |
|-----|--|----|
| 1 | Introduction..... | 6 |
| 1.1 | Front Panel..... | 7 |
| 2 | Function DIP Switches | 8 |
| 2.1 | Timer & Sensitivity DIP Switches..... | 8 |
| 2.2 | Output Relay DIP Switches | 9 |
| 2.3 | Probe Inputs | 9 |
| 2.4 | Output Relays..... | 9 |
| 2.5 | Analog Output..... | 10 |
| 2.6 | Power Supply Terminals & Ratings Label..... | 10 |
| 3 | Installation & Power-Up..... | 10 |
| 4 | Mounting..... | 11 |
| 5 | Electrical Connections..... | 12 |
| 5.1 | Probe Inputs | 12 |
| 5.2 | Output Relays..... | 13 |
| 5.3 | Analog Output..... | 13 |
| 5.4 | Power Connection | 13 |
| 6 | MTIC – Pump Station Schematic & Overview | 14 |
| 7 | MTIC – Installation Sheet No. 1 | 16 |
| 7.1 | Time Delay & Sensitivity Settings | 16 |
| 8 | MTIC – Installation Sheet No. 2 | 17 |

1 Introduction



WARNING:

Do not use this unit in environments that may contain flammable/explosive or chemically aggressive gases or powders.

The MTIC is a conductive liquid level indicator and controller which continuously monitor liquid level in order to control the operation of up to 10 appliances. It will work in the following modes:

- Fill (Charge) mode: Filling a tank
- Empty (Discharge) mode: Emptying a tank

In a standard installation, the liquid level is sensed via a MultiTrode multi-sensored probe. Individual sensors can be used in installations, if desired. Ten output relays control pumps, valves and, in addition, there are 4-20mA and 0-10V stepped analogue outputs for use with variable speed drives, chart recorders etc.

A 4-way DIP switch on the rear panel provides for the setting of four sensitivities and four time delays. In addition, a 10-way DIP switch allows for the setting of the relays as Normally Open or Normally Closed.

1.1 Front Panel

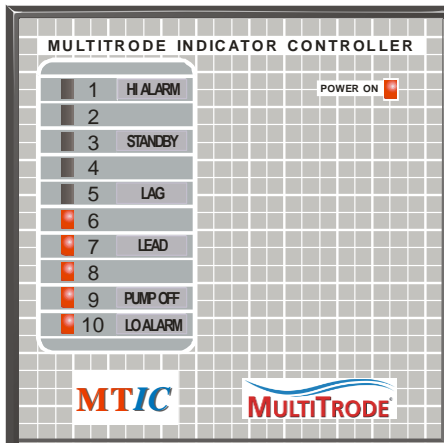


Figure 1 - MTIC Indicator Controller Front Panel

The MTIC has 11 LED's. The bar graph on the left-hand side indicates level, whilst the green LED in the upper right-hand corner indicates power availability.

There is a slot located next to the bar-graph, that is used for the placement of labels to indicate at what levels pumps and alarms operate. Up to 10 labels can be placed here.

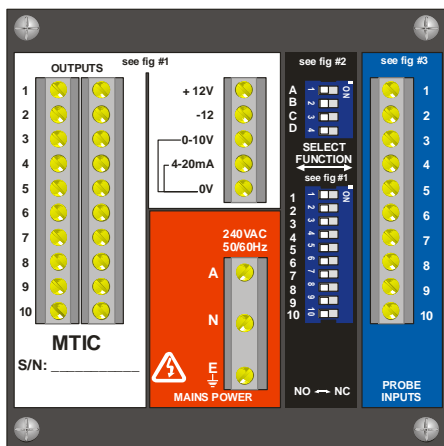


Figure 2 - MTIC Indicator Controller Back Panel

The MTIC rear panel (see Figure 2), contains the terminals, as well as function DIP switches, used to preset the unit's basic operations.

This section describes the function of each terminal and DIP switch.

2 Function DIP Switches

An important step in the commissioning of the controller is to preset the positions of the rear panel DIP switches. This will set up the basic operation of the unit to match the installation. The following tables show the switch functions.

2.1 Timer & Sensitivity DIP Switches

This section of the back panel is **black**.

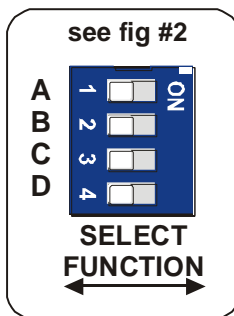


Figure 3 – The MTIC should be switched off prior to altering the DIP switch settings.

| SW | Function | Position | Description |
|----|----------------------------|----------|--|
| A | Timer | ▶ | Instantaneous actuation when level reaches sensor. |
| B | | ▶ | |
| A | Timer | ▶ | Time delay on actuation approx. 5 seconds. |
| B | | ◀ | |
| A | Timer | ▶ | Time delay on actuation approx. 10 seconds. |
| B | | ◀ | |
| A | Timer | ◀ | Time delay on actuation approx. 15 seconds. |
| B | | ◀ | |
| C | Extra low sensitivity 1KΩ | ◀ | For concentrates such as acids, minerals, alkalis leaving residue. |
| D | | ◀ | |
| C | Normal low sensitivity 4KΩ | ▶ | Acids, alkalis, diluted brine, sea water. |
| D | | ◀ | |
| C | Normal sensitivity 20KΩ | ▶ | Sullage, sewage effluent, town water. |
| D | | ◀ | |
| C | High sensitivity 80KΩ | ▶ | Effluent and processes with oil contaminants, purified water. |
| D | | ▶ | |



NOTE:
Conductance may vary from liquid type as described above. Adjust sensitivity as required.

2.2 Output Relay DIP Switches

This section is **black** in colour on the rear panel.

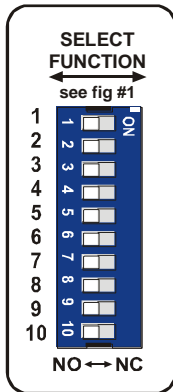


Figure 4 – Output Relay DIP Switches

Setting a DIP switch to the left or right makes the corresponding output relay act as a normally closed or normally open contact under the following condition:

- Power is supplied to the unit and no liquid covers the corresponding sensor.

2.3 Probe Inputs

This section is **blue** in colour on the rear panel.

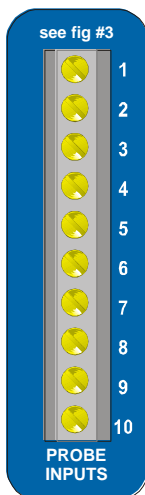


Figure 5 – Probe Inputs

A MultiTrod probe would be the normal method of level detection. Connection of ball floats is also accomplished via these terminals, although this is not recommended for reliable level detection.

2.4 Output Relays

This section is **white** in colour on the rear panel.

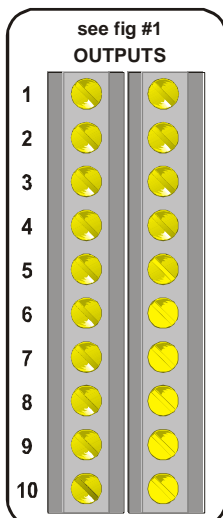


Figure 6 – Output Relays

10 programmable contacts allow for the switching of contactors or other equipment. Each relay is rated at 240VAC 5 Amp resistive or 2 Amp inductive.

The operation of the devices is controlled by level switch points hardwired to the appropriate output relay. This sets the levels at which the devices activate and de-activate.

2.5 Analog Output

This section is **white** in colour on the rear panel.

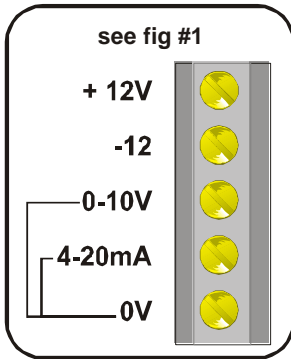


Figure 7 – Analog Output

The analogue outputs supply 4-20mA and 0-10V.

It must be noted that these outputs are non-isolated. Various wiring configurations allow for 4-20mA loads up to 940 W.



CAUTION:

Under no circumstances connect 0 volts to mains earth.

2.6 Power Supply Terminals & Ratings Label

This section is **red** in colour on the rear panel.

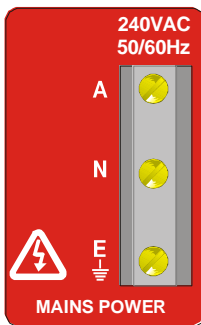


Figure 8 – Power Supply Terminals

A ratings label is located above the supply terminals and power is supplied through these terminals.

Active, Neutral and Earth are connected to their respective terminals as marked.

3 Installation & Power-Up

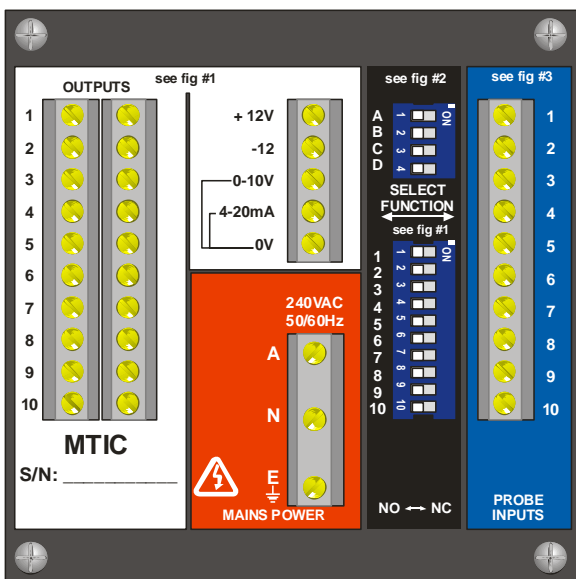


Figure 9 - MTIC Indicator Controller Back Panel

Before attempting to install the MTIC read *this section thoroughly*.

Check the power rating label above the power input terminals (see drawing below). Make sure that the power supply configuration is compatible with the installation being carried out.

4 Mounting

Mount the MTIC into a 91.0mm x 91.0mm hole (see drawing). The clamp brackets will allow installation into panels up to 8mm (absolute max.) thickness.

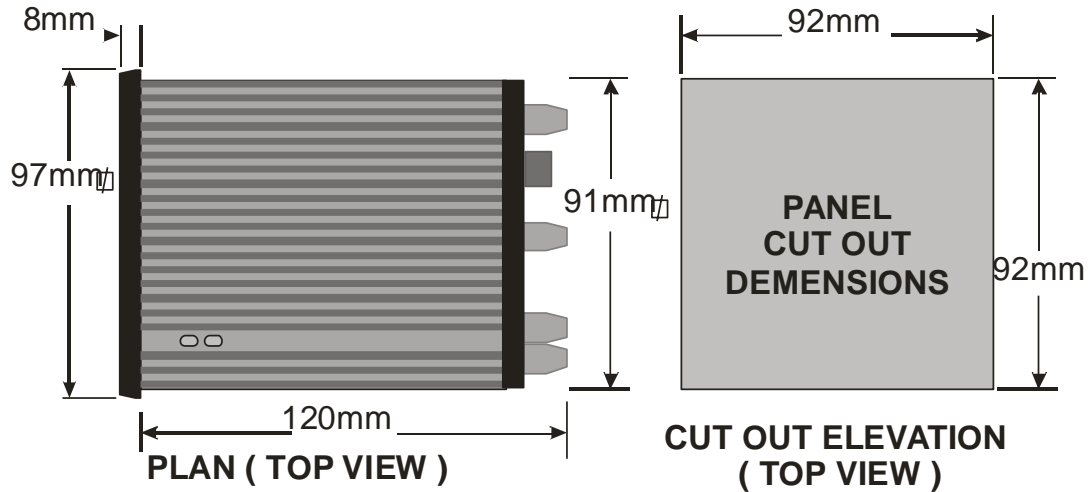


Figure 10 – Plan and elevation views of the MTIC

- Slide the controller in from the front of the panel.
- Insert the two clamp brackets into the double slots in the top and bottom of the case (see drawing).
- Tighten the screws sufficiently to hold unit.



NOTE:
Over-tightening will deform the clamps.

5 Electrical Connections

General precautions



Electrical Hazard:

- A certified electrician must supervise all electrical work. Comply with all local codes and regulations.
- Before starting work on the unit, make sure that the unit is isolated from the power supply and cannot be energized.
- Make sure that all unused conductors are insulated.
- There is a risk of electrical shock or explosion if the electrical connections are not correctly carried out or if there is fault or damage on the product.

Requirements

These general requirements apply for electrical installation:

- The mains voltage and frequency must agree with the specifications for the product.
- Circuit breakers must be installed between the main voltage line and this unit.
- All fuses and circuit breakers must have the proper rating, and comply with local regulations.
- The cables must be in accordance with the local rules and regulations.

Cables

These are the requirements to follow when you install cables:

- The cables must be in good condition, not have any sharp bends, and not be pinched.
- The sheathing must not be damaged and must not have indentations or be embossed (with markings, etc.) at the cable entry.
- The minimum bending radius must not be below the accepted value.

Earthing (Grounding)



Electrical Hazard:

- You must earth (ground) all electrical equipment. This applies to the pump equipment, the driver, and any monitoring equipment. Test the earth (ground) lead to verify that it is connected correctly.
- If the power cable is jerked loose by mistake, the earth (ground) conductor should be the last conductor to come loose from its terminal. Make sure that the earth (ground) conductor is longer than the phase conductors. This applies to both ends of the power cable.

5.1 Probe Inputs

This section is **blue** in colour on the rear panel.

Connect the cables from the MultiTrove probe to the corresponding input terminals.

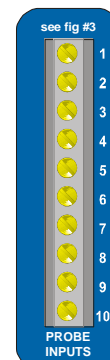


Figure 11 – Probe Inputs

5.2 Output Relays

All output relays should be protected by an 8 amp (max.) fuse.

There are 10 isolated relay outputs which can be selected N/O or N/C via DIP switches 1 to 10. Select outputs which coincide with the desired level on the probe where control is required. As the MTIC does not latch each central point, this needs to be achieved using "hold in" contacts on the contactor, as per following example:

- Hi Alarm on at 1
- Standby on at 2, off at 7
- Duty 2 on at 4, off at 8
- Duty 1 on at 6, off at 10

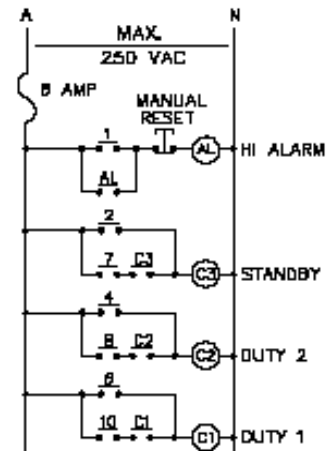


Figure 12 – Output Relays

5.3 Analog Output

This section is **white** in colour on the rear panel.

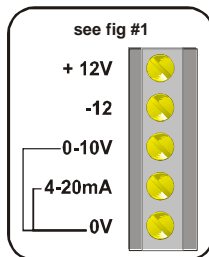


Figure 13 – Analog Output

As can be seen by the diagram the MTIC can drive into a maximum 940W if connected as shown.

It should be noted that the analogue output is non-isolated and in certain circumstances will require a loop isolator.

5.4 Power Connection

This section is **red** in colour on the rear panel.

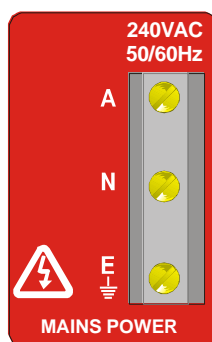


Figure 14 – Power Connections

Prior to connecting the power to the controller, the following checks should be performed:

1. Check the controller voltage rating to ensure compatibility.
2. Check that the function DIP switches have been set for the correct defaults. Connect as follows:-

A = Active
N = Neutral
E = Earth

6 MTIC – Pump Station Schematic & Overview

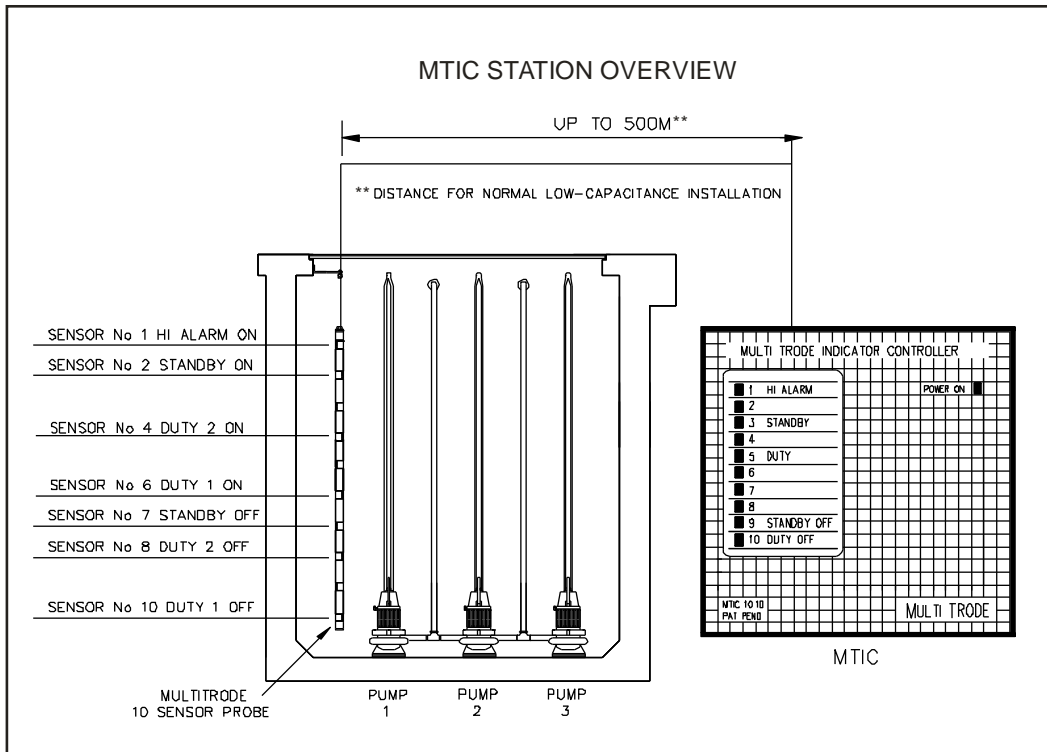


Figure 15 - MTIC Station Overview

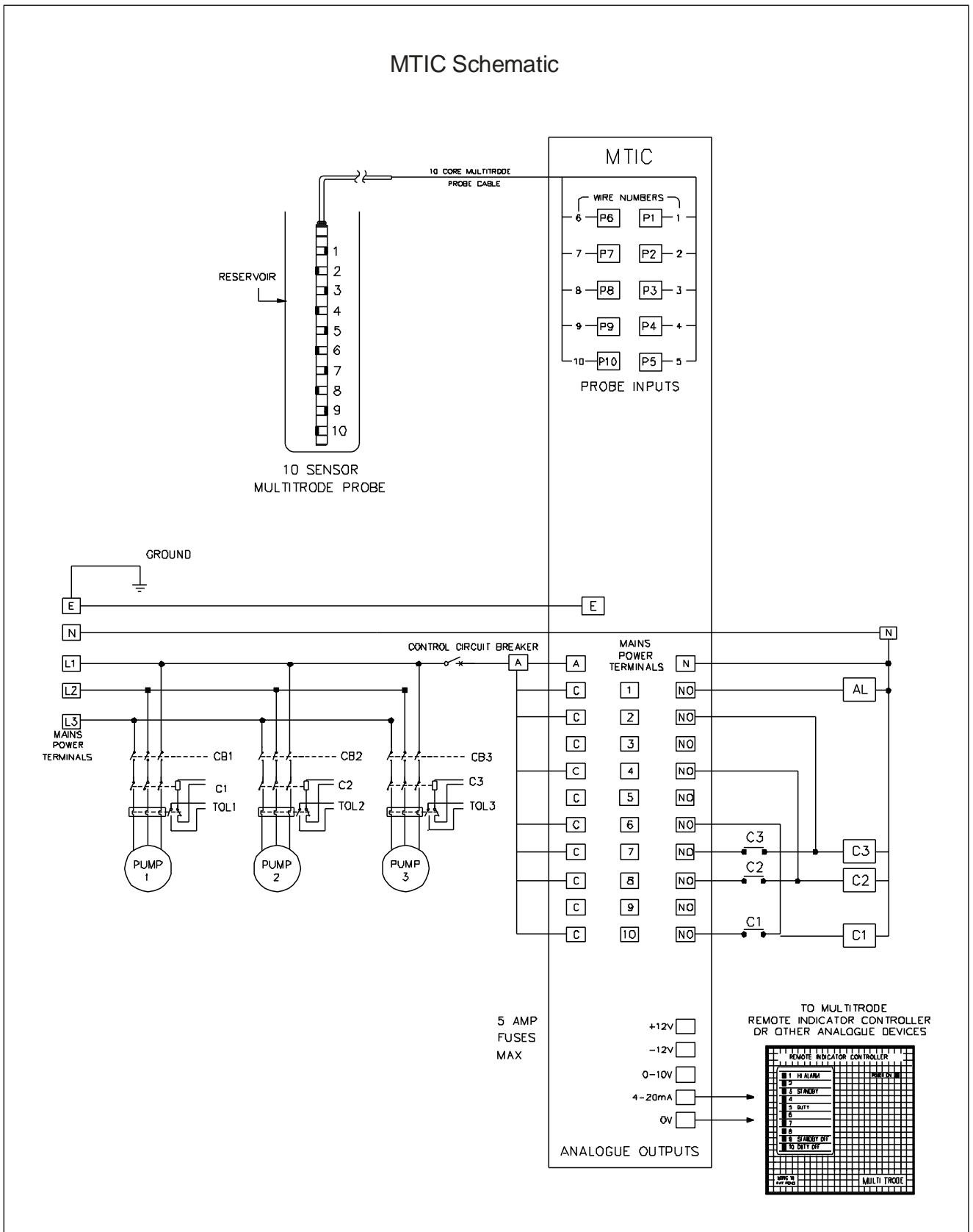


Figure 16 - MTIC Schematic

7 MTIC – Installation Sheet No. 1

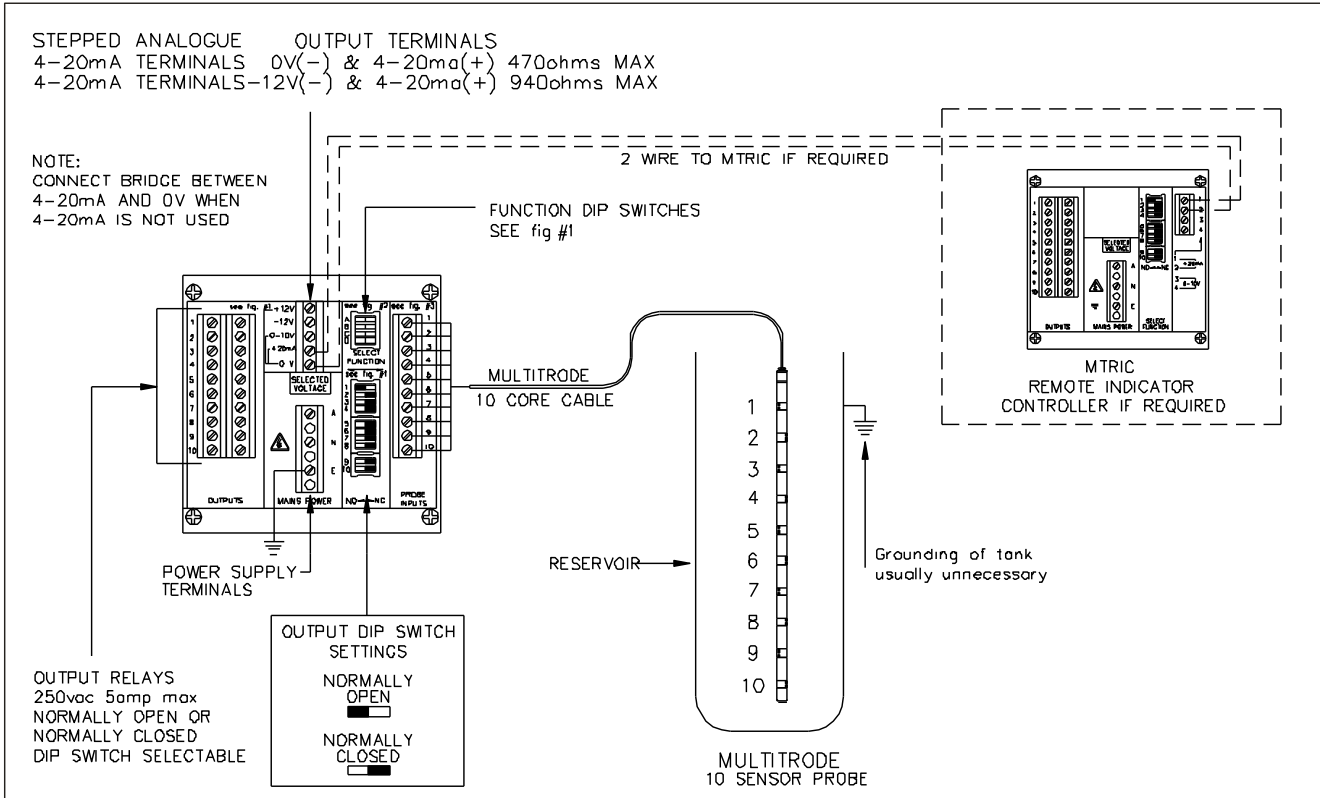


Figure 17 - MTIC Layout

7.1 Time Delay & Sensitivity Settings

| SW | Function | Position | Description |
|----|----------------------------|----------|--|
| A | Timer | ▶ | Instantaneous actuation when level reaches sensor. |
| B | | ▶ | |
| A | Timer | ◀ ▶ | Time delay on actuation approx. 5 seconds. |
| B | | ◀ | |
| A | Timer | ◀ ▶ | Time delay on actuation approx. 10 seconds. |
| B | | ▶ | |
| A | Timer | ◀◀ | Time delay on actuation approx. 15 seconds. |
| B | | ◀◀ | |
| C | Extra low sensitivity 1KΩ | ◀◀ | For concentrates such as acids, minerals, alkalis leaving residue. |
| D | | ◀◀ | |
| C | Normal low sensitivity 4KΩ | ◀ ▶ | Acids, alkalis, diluted brine, sea water. |
| D | | ▶ | |
| C | Normal sensitivity 20KΩ | ◀ ▶ | Sullage, sewage effluent, town water. |
| D | | ◀ ▶ | |
| C | High sensitivity 80KΩ | ▶ | Effluent and processes with oil contaminants, purified water. |
| D | | ▶ | |

Figure 18 – Dip Switch settings sensitivity and time delay.

8 MTIC – Installation Sheet No. 2

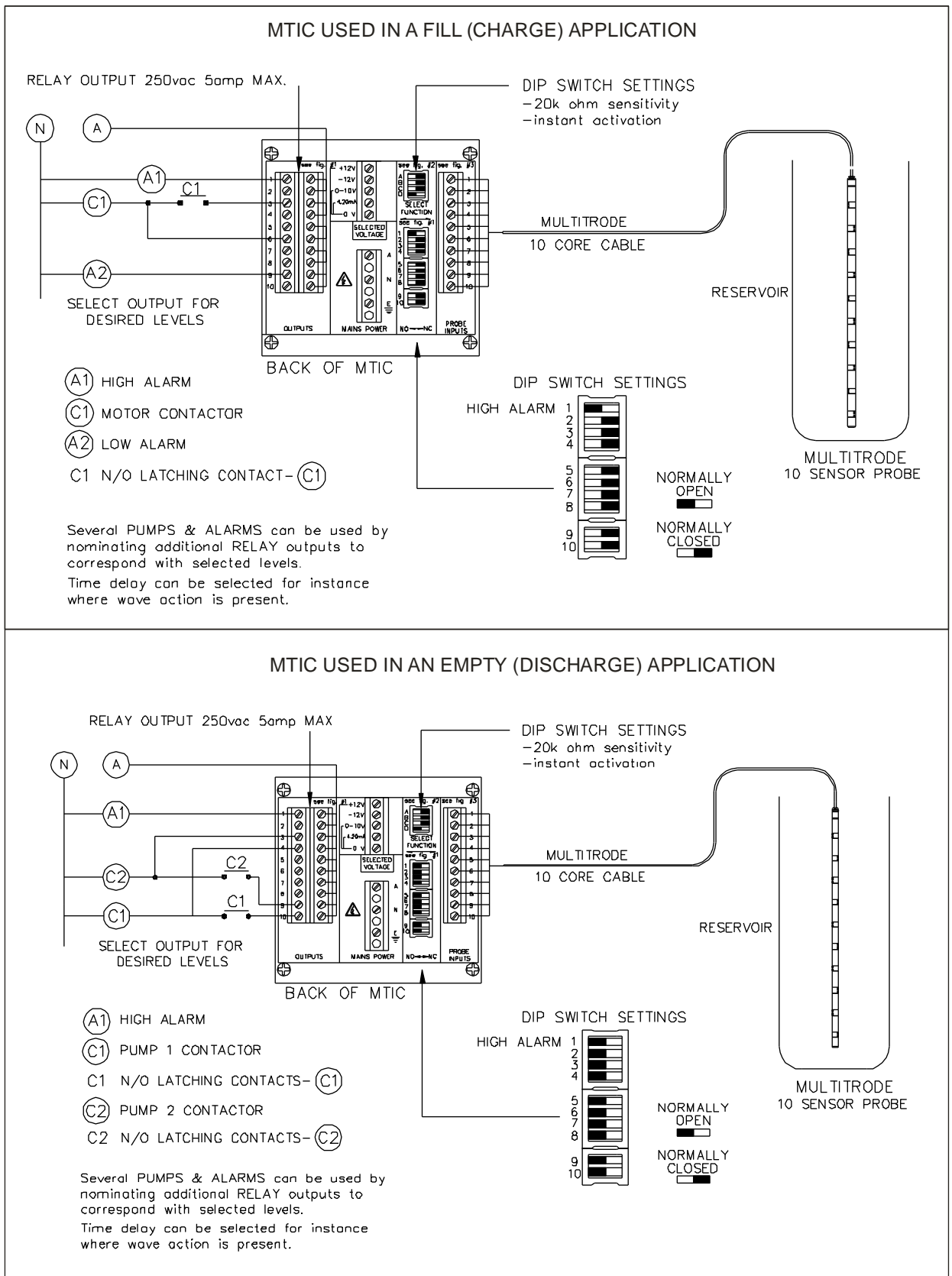


Figure 19 - MTIC used in a Fill (Charge) and Empty (Discharge) (Discharge) Applications



MultiTrode Pty Ltd—UK Operations

Ivybridge, Devon

Tel: +44 1752 547355

Fax: +44 1752 894615

E-mail: UKsales@multitrode.com

MultiTrode Pty Ltd—Head Office

Brisbane Technology Park
18 Brandl Street

PO Box 4633
Eight Mile Plains Qld 4113

Ph: +61 7 3340 7000

Fx: +61 7 3340 7077

E-mail: AUSales@multitrode.com

MultiTrode Inc—USA

Unit 3, 990 South Rogers Circle
Boca Raton Florida 33487

Tel: +1 561 994 8090

Fax: +1 561 994 6282

E-mail: USsales@multitrode.net

Visit www.multitrode.com for the latest information
