

3P DTC200

Dosing Tank Controller

Installation and Operation Manual



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Installation

Safety

Mains Voltage – There are exposed electrical conductors inside this appliance. This appliance must be installed and serviced by a competent electrical technician to the current requirements of BS7671 and IEEE recommendations. Before servicing this appliance, normal safe isolation procedures should be implemented.

Do not touch the PCB while energised, it carries mains voltage.

Do not touch any connection terminals while energised.

Do not attempt to service this item when wet, or in a wet or high humidity environment.

If the housing of the control panel becomes damaged, you must shut down and securely isolate this appliance immediately.

You must connect this appliance to a grounded 3 wire supply, protected by suitable overload protection. Connected pumps and solenoids are earthed via the control panel, and may otherwise become live.

If the power cables are damaged, either to or from the controller then shut down and isolate this appliance.

The combined loading of pumps and solenoids connected to this appliance must not exceed 20A using the supplied mains flex. Contact the manufacturer for advice if you need to exceed this rating.

Do not attempt to repair any part of the circuit board. Refer to the manufacturer for advice.

Included Components

- 1 x Control Panel
- 4 x Level Sensors (magnetic reed switch mini-float)
- 1 x Wall mounting brackets

Layout

DTC200 is a wall mounted control panel designed to control 3 pumps or valves at 230VAC single phase, or any voltage via external relays/contactors. No fluid passes through the control unit itself and it's location in relation to other equipment is only constrained by cable distances.

The control panel cannot be mounted outside, it is splash proof but not designed to resist persistent rain or immersion.

Connected pumps or valves must be less than 10A@230VAC

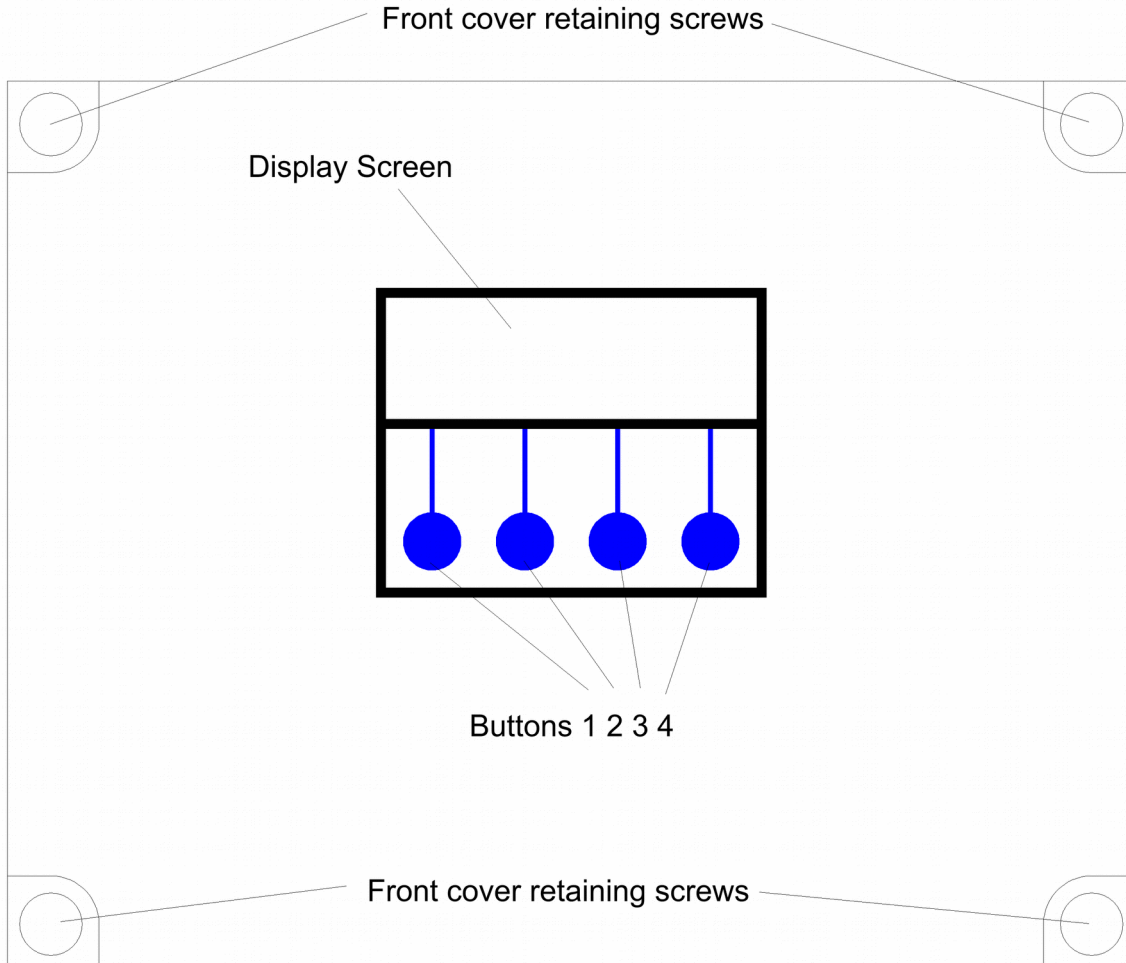
Voltage drop will affect the cable size needed to take power to your pumps. Over very long runs, you may find it more economical to install contactors near to the pumps, allowing you to control the pumps with a

sensible cable size. It is strongly recommended that you calculate voltage drop for cable runs which exceed the length of cable supplied with the pump. Failure to do so may result in cable overheating, conductor migration, and risk of fire. The same caution applies to solenoid valves, although the current draw is usually so small that only extreme distances are likely to present a problem.

Level sensors provided and reed switch sensors. These are installed via a 16mm hole through the tank wall. All 4 sensors should be installed so that they lie horizontal when dry and flap upwards when immersed. Other types of sensor or traditional float switches may be used as long as they produce a closed circuit when dry and open circuit when immersed. Cables extension is straightforward, shielded cable is recommended for distances exceeding 10m or wiring runs in close proximity to other power circuits.

Control Panel Mounting (without use or mounting brackets)

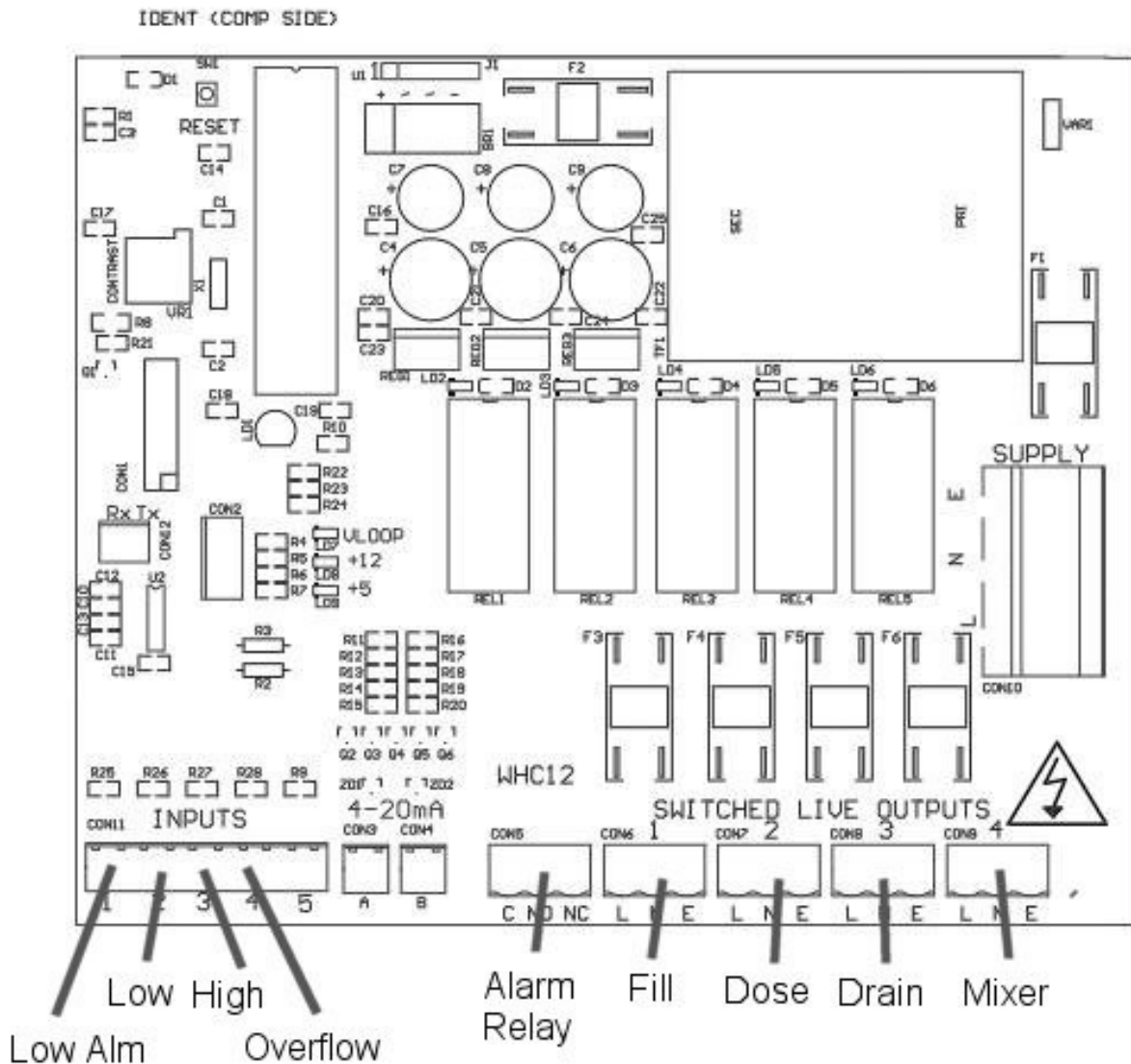
Having selected a suitable location, unlock the 4 locking screws on the corners of the front cover and open the front panel (hinges to the left). The LCD display, buttons and alarm LED are connected to the PCB.



The 4 screw mounting holes are located on the main enclosure in recesses adjacent to the front panel mounting holes. Mark drilling points on the wall accordingly. Withdraw the casing from the wall and drill holes appropriate for your selected fixings. Control Panel Mounting (using mounting brackets)

Attach the 4 mounting brackets to the rear corners of the enclosure and then screw the whole assembly to the wall.

Connections



Mains Power Connection

The power supply to the control panel enters via a cable gland on the bottom right of the housing. Insert the cable, connect to the large incoming power terminal on the right of the PCB, and tighten the cable gland.

Pump/Valve Power Connections

Pumps or valves are powered from the 3 pin green terminals on the lower right of the PCB marked with LNE. Terminal con6 supplies power to fill the tank, con7 for the chemical dosing pump, con8 drains the tank con9 may optionally be used for a mixer/agitator/aerator to assist the reaction. The terminal blocks are socketed and can be withdrawn from the PCB for ease of access.

Alarm Relay Connection

The alarm relay connection provides a non-voltage relay capable of switching any 230V source up to 16A. Three contacts are provided, Common, NO and NC.

Level Sensor Connection

Levels sensors are connected to terminal con11, sensors supplied are reed type mini floats installed through the tank wall, conventional float switches, capacitive, vibrating fork, or other sensors may be used as long as they provide a closed circuit when dry and open circuit when immersed.

To install the supplied sensors drill a 16mm hole to each sensor and fit so that they lie horizontal when dry and flap upwards when immersed. Ensure minimum 50mm spacing between each sensor.

For cable lengths exceeding 10m a shielded cable is recommended particularly if the cable is run near to mains power circuits, this will help to prevent induction of stray voltages from nearby circuits which may cause false readings.

Operation

Safety Considerations

Mains Voltage – There are exposed electrical conductors inside this appliance. This appliance must be installed and serviced by a competent electrical technician to the current requirements of BS7671 and IEEE recommendations. Before servicing this appliance, normal safe isolation procedures should be implemented.

Do not touch the PCB while energised, it carries mains voltage.

Do not touch any connection terminals while energised.

Do not attempt to service this item when wet, or in a wet or high humidity environment.

If the housing of the control panel becomes damaged, you must shut down and securely isolate this appliance immediately.

You must connect this appliance to a grounded 3 wire supply, protected by suitable overload protection. Connected pumps and solenoids are earthed via the control panel, and may otherwise become live.

If the power cables are damaged, either to or from the controller then shut down and isolate this appliance.

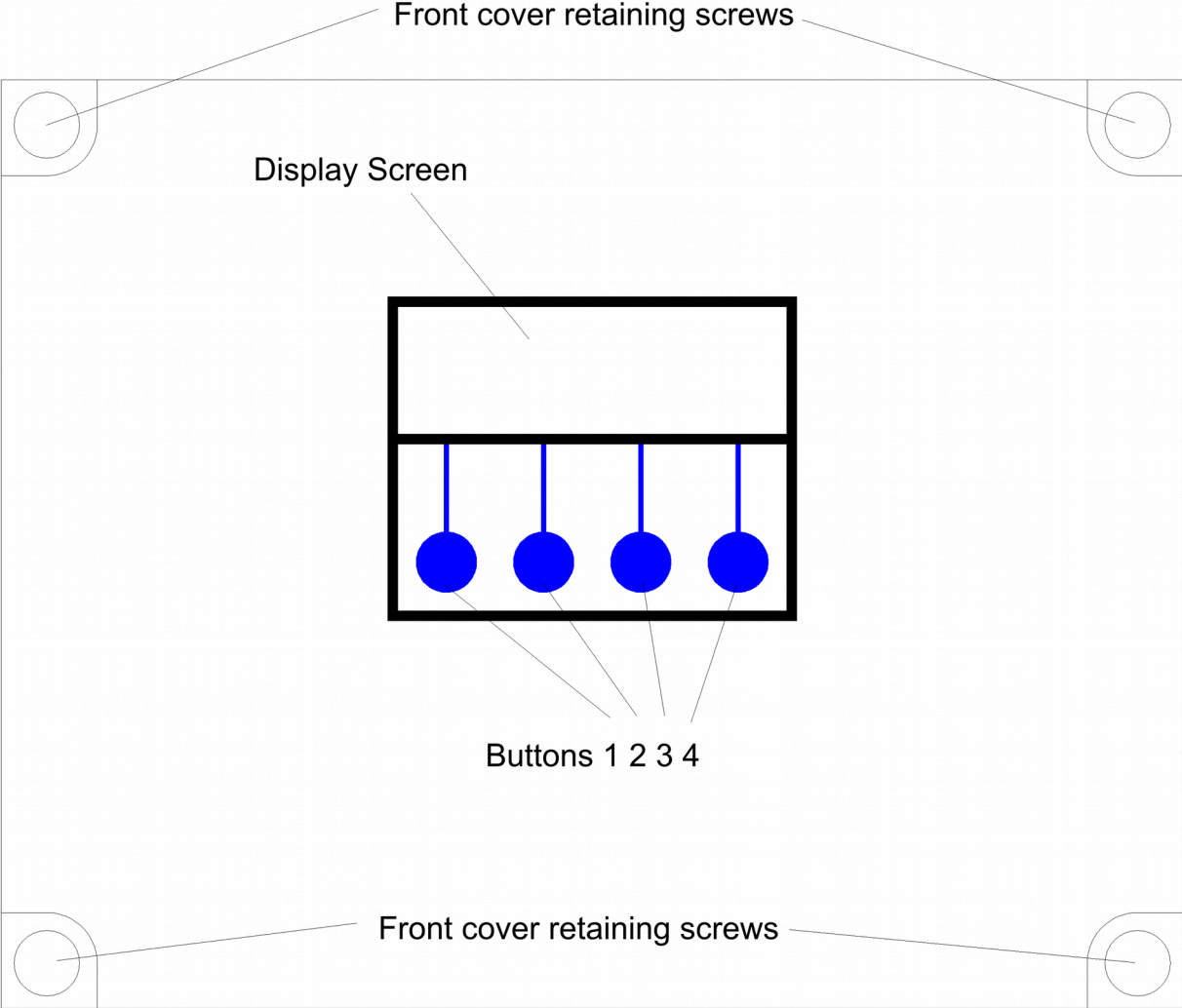
Do not attempt to repair any part of the circuit board. Refer to the manufacturer for advice.

Description of Operation

DTC200 is a time-delay based controller for chemical dosing of fluids within a processing tank. The operation cycle consists of tank filling, tank dosing, reaction delay, and tank draining.

Dosing and reaction time are both variable in 1 minute intervals up to 253 minutes duration. Tank filling and draining are level based.

Control Panel Operations



Startup Screen Menus and Functions

Upon first applying power, the LCD panel will display a startup logo followed by automatic calibration of the rainwater tank sensor for approximately 3 seconds, and then immediately commence operation. The main screen displays the following information:

Tank State (Tank Filling/Full/Tank Emptying)
Dosing State (Dosing/Reacting)
Time Remaining if a timed operation is in progress
Menu Options

Accessing the Menu Options

The last line of the display always shows up to four menu options, which can be selected by pressing one of the four corresponding buttons beneath the display. The menu options displayed will change as you enter different areas of the software.

Status Screen

Accessing the Main System Menu

While in the main status screen, button 1 can be used to access the menu for configuration. Whilst in this area all operation is halted while parameters are being set by the operator. To exit press "Run" or "Exit".

Main Menu

Provides access setup and diagnostic functions, or resume operation by pressing RUN.

Setup Menu

Provides access to

1. Dosing Mode
2. Timer Settings
3. Alarm Enable/Disable

Dosing

By pressing the change button you can switch operation between Dose While Filling or Dose After Filling. The default setting is Dose After Filling in which the tank is filled, chemical dosing occurs followed by a reaction delay and the tank is emptied.

Dose While Filling starts the chemical dosing pump as the tank begins to fill and begins the dosing timer. Once the timer expires the tank will continue to fill and once full the reaction delay will start. In the event that the tank fills before dosing is completed then the dosing will continue until it's time is completed and the reaction delay begins. This mode reduces the total duration of the processing cycle.

Timers

Allows setting the dosing and reaction timers.

Dosing Pump Timer

Press the – or + button to increase or decrease the time for which the dosing pump will run. Pressing and holding this button will produce a larger increase or decrease. Exit when done.

Reaction Timer

Press the – or + button to increase or decrease the time after dosing during which the reaction will be allowed to take place. Pressing and holding this button will produce a larger increase or decrease. Exit when done.

Alarms

High (Overflow)

Press Change to enable or disable the High Level Alarm (Overflow Alarm), if the overflow sensor is not fitted this alarm should be disabled. Press Exit when done.

NOTE - If an overflow is sensed during use the system will stop all filling or dosing activity and immediately empty the tank. If this cannot be allowed (i.e. preferred option during high level sensor fault is to overflow the tank) then you must disable this alarm.

Low

Press Change to enable or disable the Low Level Alarm, if the overflow sensor is not fitted this alarm should be disabled. Press Exit when done.

Activation of the Low Level Alarm during use does not prevent the tank from filling.

Mixer

Enables and configures the optional output for a mixer/agitator or aeration pump.

Use the – and + buttons to choose between the following settings

- **Not Active** – The output will remain off at all times.
- **While Reacting** – On during the reaction delay time
- **While Dosing+Reacting** – On during dosing and during the reaction delay
- **All Except Draining** – On during tank filling, dosing and reacting
- **Full Time** – Output will be permanently live

Once the desired option has been chosen push button 4 to exit

Diags (Diagnostic Menu)

Allows you to view the state of the level sensors or activate the outputs manually.

Inputs

Displays the state of all 5 inputs, note that input 5 is unused in this product.

0 = closed circuit (no fluid)

1 = open circuit (sensor immersed)

Outputs

All 4 outputs can be activated by pressing buttons 1 to 4 on the keypad. The exit this menu you must press buttons 1 and 4 together and release (or power down the system).

Run

Resume operation. Select this to return to the main operational display when configuration/diagnostic is finished.

Stop

At any time while the system is running (i.e. not in a menu setting), the operation of the panel, pumps and solenoid can be halted by pressing STOP. Unlike pressing Menu, this option will activate the BMS output to indicate that the unit has been halted for a purpose other than configuration. It is expected that this button may be used by persons with no knowledge of the system and/or no access to the Operation Manual. Under this setting there are 3 options.

Menu

Enters the main system menu.

Wipe Configuration (Wipe Config)

This option wipes all configuration settings from memory then restarts the system. Default values will then be loaded and the system will behave as if it were switched on for the first time.

Note – Any options set during commissioning will be lost and need to be re-entered.

Restart

Restarts operation of the system.

Troubleshooting

Refer to the Safety instructions. No electrical works should be carried out other than by an appropriately qualified Electrician. Permits to work may be required at local site conditions. If in any doubt, consult your system supplier.

Problem	Probable Cause	Solutions
No Power – controller dead – no backlight on LCD	No power supply from distribution board	Check 220-240 vac 50hz supply at power input terminals.
	Fuse failed	Check Fuse F1
	PCB damaged	Replace PCB, contact manufacturer.
Backlight on – no display – no operation	CPU chip missing	Insert CPU
	CPU chip badly inserted or bent pins	Insert CPU correctly or replace if necessary
	CPU chip wrong way round	Remove and re-insert correctly Replace CPU
	CPU chip faulty PCB damaged	Replace PCB, contact manufacturer.
Controller Frozen – operates normally but keypad unresponsive	Keypad not connected or connected wrongly	Check connection
Controller Frozen – does not operate normally	CPU or oscillator damaged	Replace CPU, if no success replace PCB
Tank level sensor does not function (error 6)	Not connected	Check wiring to controller
	Sensor faulty	Test with continuity meter, replace sensor if necessary
	Input circuit faulty	Test with jumper wire, replace PCB if necessary
Tank shows full or overflow condition constantly	Sensors disconnected	Check wiring
	Incorrect sensor function or orientation	Ensure sensors show closed circuit when dry, open circuit when immersed.
Low Alarm	Sensor disconnected	Check wiring

	Sensor activated	Check drain valves and tank integrity. Check output to drain pump.
	Sensor not present	Disable alarm function from menu or install sensor
Overflow Alarm	Sensor disconnected	Check wiring
	Sensor activated	Check output to filling and dosing pumps
	Sensor not present	Disable alarm function from menu or install sensor
1 or more outputs does not switch off	Sensor failure	View sensor status from the diagnostic menu or test sensors with continuity meter and correct.
	Relay welded open (LED above relay not lit but output still live)	Replace PCB.

Fuse Listing

F1 – 500mA 20mm quickblow
F2 – 1A 20mm glass passivated
F3 – 10A 20mm glass passivated
F4 – 10A 20mm glass passivated
F5 – 10A 20mm glass passivated
F6 – 10A 20mm glass passivated

Inputs (left to right) – Con1

1 – Low Alarm (installed below low level sensor)
2 – Low (tank empty)
3 – High (tank full)
4 – Overflow (installed above high level sensor)
5 – unused

Pressure Sensor Inputs (left to right)

Con3 (left) – unused
Con4 (right) – unused

BMS Output

Type – Non contact relay

Terminals – Common, Normally Open, Normally Closed

Power Rating max 16A 250Vac

Pump/Valve Control Outputs (left to right)

1 – Tank filling

2 – Tank Dosing

3 – Tank Draining

4 – unused

Specifications

Control Panel

Dimensions	240mm x 190mm x 110mm
Supply Voltage	230-240 Vac 50Hz
Power Consumption	7w (control panel only)
Operating temperature range	0 to 40 degrees celsius
Ingress Protection (EN60529)	IP65
Electrical Insulation	Class 2

Switched Outputs (pump/solenoid control)

Voltage	220-240vac 50hz (exact voltage as supply voltage)
Current	10A (peak 16A)