

**OPERATING
&
MAINTENANCE MANUAL**

**COMPACT 7T CHLORINE
DIOXIDE DOSING UNIT**

COMPACT 7T DOSER SYSTEM

The Compact 7T Doser provides a Chlorine Dioxide Chemical Dosing Programme for Cooling Tower Systems. The Compact 7T Doser incorporates the following elements: -

TWIN PUMP OPERATION

Two DLPK 0405 dosing pumps are used to dose the two liquid chemicals in the same quantity.

MIXING AND INJECTION BLOCK

A PVC mixing block is incorporated to mix the two liquid chemicals prior to injection into the system. This ensures that Chlorine Dioxide is formed before the chemical makes contact with the system water.

TIMED CHEMICAL DOSING

The integral P.L.C Controller provides up to three dose cycles per day, on a day frequency basis. This gives flexibility of dosing cycles. The P.L.C Controller calculates the amount of time that the pumps have to dose for a given Dose Amount input, ensuring set up of the system simple.

CHEMICAL DRUM LOW LEVEL WARNING

Two suction lances are provided with the system and incorporate a liquid level pressure tube. This connects to the Control Cabinet pressure switch and detects the level of chemical in the chemical drum. The system does not have any moving parts or electrical connections in the chemical and so is more reliable. The P.L.C indicates a low chemical and shuts off both the chemical dosing pumps to prevent damage to them.

COOLING TOWER LOW WATER LEVEL WARNING

A Vegaswing level switch is incorporated into the system to prevent chemical injection in the event of the Cooling Tower Sump draining of water. The Vegaswing is a "tuning fork" type level switch, which has the advantage of not being prone to depositing from "hard water" or rust. The P.L.C indicates a low tower water level and shuts off both chemical dosing pumps to prevent chemical injection.

CONTROL CABINET

The system Control Cabinet consists of three 300x200x150mm powder coated steel enclosures connected side by side to form a three partition enclosure. The left hand and right hand enclosure house the two chemical dosing pumps. This ensures the two chemicals do not come into contact prior to mixing in the injection block. The central enclosure houses the Control for the system. This comprises of a P.L.C with a door mounted Text Display Unit. An Alarm Warning Beacon is mounted on the top of this enclosure. The Text Display Unit provides Operator system status information, system control keys and system setting adjustment. The complete cabinet is weather proof for outside installation.

SYSTEM INSTALLATION

MECHANICAL

The Control Cabinet has four mounting brackets incorporated for direct wall mounting.

The Suction Lances are already connected and simply have to be placed in the appropriate chemical drum.

The Mixing/ Injection Block has a 1" male thread for threading into a pipe socket, or fitting through a tank wall.

The Vegaswing level switch has a 1" male thread for threading into a pipe socket, or fitting through a tank wall.

The 4/6mm PE injection tubing for the two pumps should be connected to the outlet of each of the dosing pumps and then to the injection fittings on the Mixing/ Injection block.

Drawing 02 shows general arrangement for installation.

ELECTRICAL

Connect a **110/1/50** supply, fused at 6A, to the following terminals in the central Control Enclosure.

Terminal 5T NEUTRAL
Terminal 7T EARTH
M.C.B Terminal LIVE

The signal cable for the Vegaswing level switch is pre connected and has a 4-way plug for connection onto the Vegaswing level switch socket.

The Compact 7T unit has an integral text unit front mounted on the control panel for operator interface.

The text unit is made up of the following components:-

COMPONENT	DESCRIPTION
Text Display Area	The text display area is a backlit liquid crystal display (LCD) with 20 character lines. All status and settings messages are displayed here.
Keys	The text unit has nine keys, five of these provide pre-defined, context-sensitive functions, and four keys provide functional control operations. These labelled and are described in the table below.

COMMAND KEY	DESCRIPTION
ENTER	Use this key to write new data and to acknowledge a message(s)
ESC	Use this key to toggle between display message mode and menu mode, or to abort an edit.
UP ARROW	The up arrow increments data and scrolls the cursor to the next upper message.
DOWN ARROW	The down arrow decrement and scrolls the cursor to the next lower message.
SHIFT	Allows operation of the "upper" Function keys. A flashing 'S' is displayed in the lower right of the display when you press the SHIFT key.

FUNCTION KEY	DESCRIPTION
STOP	Press once to stop the system dosing. Displayed on text display. This function will prevent any further dosing until the START key is pressed.
PRIME 1	Press and Hold to prime Dosing Pump 1. Release and the pump will stop after a few seconds.
PRIME 2	Press and Hold to prime Dosing Pump 2. Release and the pump will stop after a few seconds.
RESET	Press once to return from the setting menu.
START (SHIFT + STOP)	Press once to start the system dosing. Displayed on text display. This function allows the pumps to operate on the Timed Dose cycle input by the operator.
	No function.
TEST (SHIFT + PRIME 2)	Press once to initiate a timed dose cycle of the dosing pumps. This will be equal to the calculated time shown on the text display. Used as a shot doser.
SET (SHIFT + RESET)	Press once to display the setting menu. This is a list of the possible system setting. Use the Arrow keys to scroll through the list and adjust as required. Once adjustment has been made return to the status menu by pressing the RESET key. Unit will default back to this menu if no keys are pressed for 5 minutes.

INPUT SETTINGS MESSAGE LISTING

Press the SET key on text unit to access. Press the RESET key to return to status messages. System will default to status messages after five minutes if RESET key is not pressed.

SCREEN MESSAGE	FUNCTION
DOSE DAY FREQ: __	Set the frequency of the Timed dosing cycles. 1 will equal every day, 7 will equal every 7 th day.
DOSE TIME 1: ___HRS	Set the time of day for the first dosing cycle. Set in 24hr clock. I.E: 18HRS equals 6:00 pm.
DOSE TIME 2: ___HRS	Set the time of day for the second dose cycle. Set in 24hr clock. If not required leave as zero.
DOSE TIME 3: ___HRS	Set the time of day for the third dose cycle. Set in 24hr clock. If not required leave as zero.
DOSE AMOUNT ___ _LTR	Set the amount of Chlorine Dioxide, in LTRS, requires to be dosed at each dose time.

INPUT SETTING ADJUSTMENT PROCEDURE

Once in the input settings message listing use the arrow keys to scroll through the messages. To adjust any of the settings follow the procedure below.

- STEP 1 When cursor is flashing on the left most character of the line you wish to adjust the setting on, press ENTER.
- STEP 2 The screen will display 'PASSWORD REQUIRED'. Enter the correct four digit number by pressing the down arrow key until the first correct digit is displayed. Press the ENTER key. Repeat for all four digits.
- STEP 3 The cursor will now be flashing on the setting number to be adjusted. Use the up and down arrow keys to adjust number to desired value. Press the ENTER key when complete.
- STEP 4 The display will revert back to displaying the first input setting message. Use the arrow keys to scroll down to the last adjusted message to confirm new entry has been registered.
- STEP 5 Repeat the above steps as required.
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In the event of an error being made in any of the above steps press the ESC key to abort the last operation and then begin again.

To return to the status messages press the RESET key.

SETTING UP DATE AND TIME OF DAY

Follow the following steps to adjust the date and time of day.

- STEP 1 With display showing status messages press ESC key.
- STEP 2 'ENTER PASSWORD' is displayed. Enter the correct four-digit number by pressing the down arrow key until the first correct digit is displayed. Press the ENTER key. Repeat for all four digits.
- STEP 3 'VIEW MESSAGES' is displayed. Press down arrow key until 'SET TIME AND DATE' is displayed. Press the ENTER key.
- STEP 4 Current date and time is displayed. With cursor flashing on date of month use arrow keys to set correct figure. Press ENTER. Repeat this step for remaining figures.
- STEP 5 When final figure has been entered display will revert to status messages.
- STEP 6 Press ESC key at any time to revert back to status messages.

SYSTEM COMMISSIONING

Follow installation guide as described earlier. Once complete switches electrical supply to system on.

Input required setting for the system on the Text Display Unit as described earlier.

Place both suction lances into a bucket of clean water and prime both of the dosing pumps, either by using the PRIME keys, or the TEST key. Ensure there are no leaks from the chemical tubing. Remove lances from the water and place in the appropriate chemical drum.

NOTE: BE SURE NOT TO PLACE THE LANCE IN ANY OTHER CHEMICAL APART FROM THE ONE WHICH HAS BEEN DESIGNATED FOR THE SYSTEM AND THE PARTICULAR PUMP.

Ensure System is ONLINE, as displayed on the Text Display.

Carry out a function test of the low level chemical switches by removing each of the lances from the chemical drums and monitoring the Text Display for an alarm message and also checking the beacon is illuminated. Once complete replace lances. Next check Vegaswing level switch operation by leaving the switch uncovered by water. Again the Text Display should show an alarm message, and the beacon should illuminate.