Elnet XP controller

Drainage and sewage pumps controller
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CE

Chapter 1 – Introduction

1.1 Drainage and sewage pumps controller

The automatic pumps controller is used to operate drainage and sewage pumps. It is used for automatic level control for rainwater or sewage water.
The controller automatically switch between two pumps at each operation in order to balance the working hours and operating two pumps when needed.
These systems are located in factories, hotels, hospitals, universities, office buildings and any other public structure where a reliable system is required to operate pumps for draining rainwater or sewage.

Another capability available in the controller is the ability to display colorful graphics illustrating the operation of the system clearly to the maintenance man, including a historical alarm report that includes registration of up to 1000 events and alerts including the date and time of occurrence of the malfunction.

The controller is a compact unit with color graphic screen, advanced technology that is easy to install and operate, and is designed to be easily integrated into **Modbus** or **BACnet** open source control systems.

The controller is operated by means of a menu written in English, which guides the user step by step.

The controller is manufactured using technology that uses high quality components.

1.2 We would appreciate your comments

Control applications thank you for choosing our product. We are confident that the equipment provided by us will serve you well for many years.

Despite all the efforts made to get the best product, the most reliable, the most accurate and the highest technological level, we believe that you can always improve and we will be happy to use your comments to improve our products. We would appreciate your comments to the quality control department as follows:
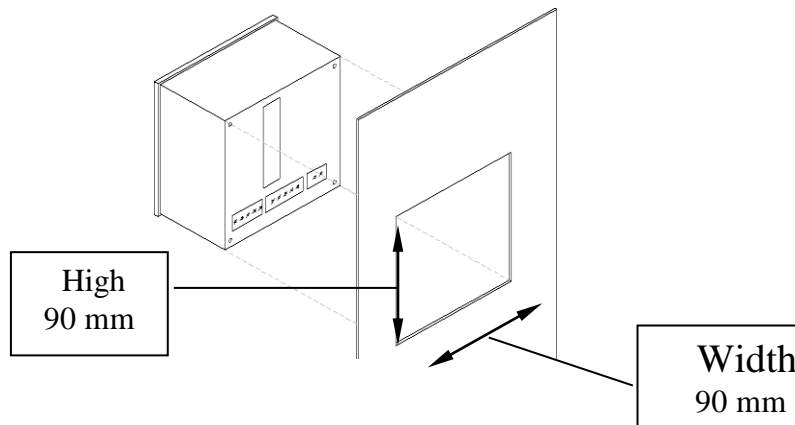
Control Applications Ltd.
Quality control department
Ha' Barzel st. Tel-Aviv Israel
6971035

cal@ddc.co.il

Chapter 2 – Installation

2.1 Mechanical installation of the controller

1. Select the appropriate place to install the controller and make a square hole on the electrical board as described in Figure 2.1.

High
90 mm

Width
90 mm

Figure 2.1 Hole in the power board

2. Insert Elnet XP into the appropriate hole that has been prepared in advance on the power board, and make sure that the device is inserted in the correct direction. The plastic tab has the ability to fasten the power boards of tin thickness from 1 mm to 4 mm
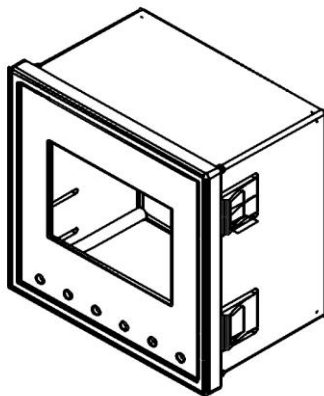
Figure 2.2 Tabs for mechanical installation

2.3 Electrical wiring
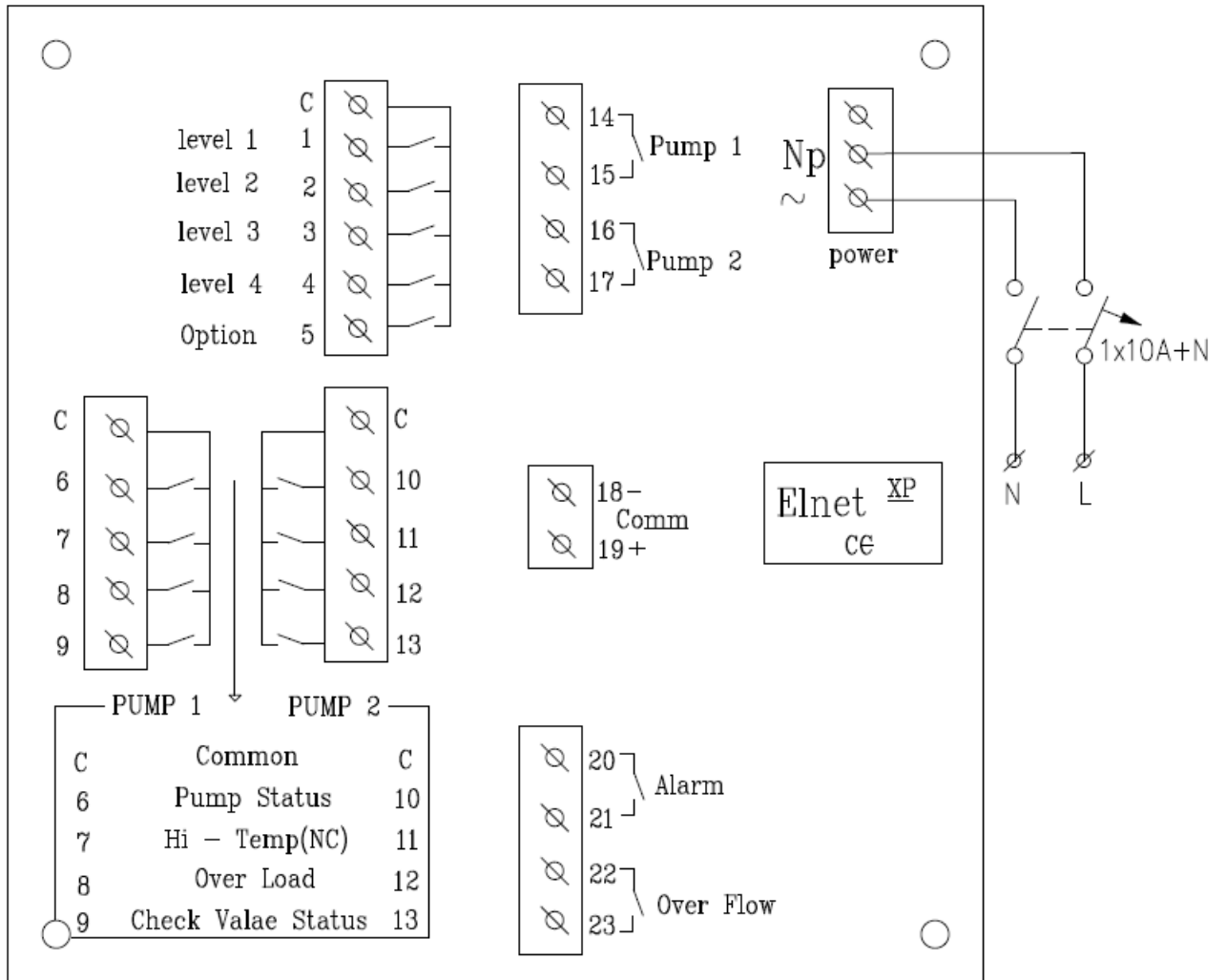
2.4 Types of electrical connections

All electrical connections of the appliance are made using electrical connectors located on the back of the appliance.

The bolts should be bolted gently, maximum recommended torque is Nm0.5.

Supply and installation of suitable relays and measurement sensors under the customer's responsibility.

Remarks	Description	Marking electrical connectors	
6A fuse must be installed	Neutral line, 230VAC input voltage		Np
6A fuse must be installed	Phase line, 230VAC input voltage		~
	L1 level switch C-1 - **shut off level**	**D.In**	1
	L2 level switch C-2	**D.In**	2
	L3 level switch C-3	**D.In**	3
	L4 level switch C-4 - **Overflow**	**D.In**	4
	Option	**D.In**	5
	Auxiliary contact - Pump 1	**D.In**	6
	Engine Heat Indication(NC)- Pump 1	**D.In**	7
	Over load - Pump 1	**D.In**	8
	Check valve 1 status indication	**D.In**	9
	Auxiliary contact - Pump 2	**D.In**	10
	Engine Heat Indication(NC)- Pump 2	**D.In**	11
	Over load - Pump 2	**D.In**	12
	Check valve 2 status indication	**D.In**	13
Up to 8A dry contact	Pump 1 relay output	**D.Out**	14-15
Up to 8A dry contact	Pump 2 relay output	**D.Out**	16-17
	RS485 Communication output	**Comm**	18-19
Up to 8A dry contact	General alarm relay	**D.Out**	20-21
Up to 8A dry contact	Overflow alarm relay	**D.Out**	22-23

Chapter 3 - Operating Instructions

In this chapter you will find a description and instructions on how to operate the unit by using the push buttons

3.1 Operating panel

The operating panel has 6 operating buttons and a 320x240 illuminated graphic color LCD screen, all instructions are in English, and for details of the operation buttons and their function see Chapter 3.2
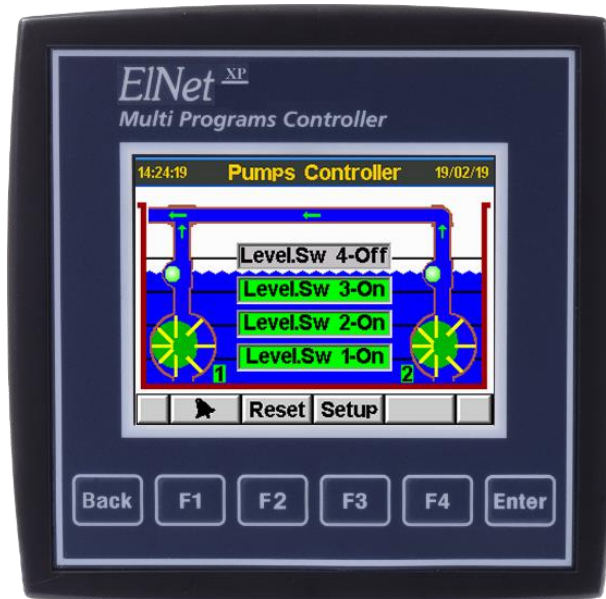

Figure 1-3 Operating Panel

3.2 operating buttons

The device has 6 operation buttons. These buttons can be used to perform all of the functions described below:

The **Enter** button performs the selected opration.
The **Back** button allows you to return to the main menu or back screen.
Buttons **F1 through F4** perform the function recorded in the display above buttons (F1 through F4)

F4 "Mute" button

This button is intended to mute the internal buzzer, pressing it will silence the buzzer until a new malfunction occurs.

F3 "Set" button and entering technician code

This button allows you to change the controller operation and delay settings. These changes requires a "Technician Code" - to enter this screen you must set the code "1" by pressing the + / - buttons and pressing Enter.

F2 button "reset"

This button lets you reset all active alarms and actually performs a controller reboot.

Chapter 4 – Pumps Testing

After pressing the "Set" button (F3) and entering the Technician Code as described in Section 3.2 above, the following selection options appear:

1. Pumps testing
2. Timers and operating settings
3. Non-essential settings

4.1 Pumps testing

Selecting "Pumps testing" allows the technician to do the following:

4.1.1 pumps operation in fixed forced mode
This option allows you to "turn off" the automatic pumps control.

Canceling the automatic mode is under the technician/customer responsibility, be careful not to leave the controller in this mode for an unnecessarily long time. From this screen you can operate each pump in a non-automatic way (Manual mode) in all possible operation modes, ON / OFF / AUTO.

4.1.2 Temporary testing of pumps
Entering this screen disables the automatic operation of pumps (actually stops the operation of the pumps). And allows the technician to turn on / off each of the pumps to see the system's response on the display screen, the technician / client must be careful not to leave the controller in this screen unnecessarily long time Exiting this screen returns the controller for automatic operation.

4.1.2 Full automatic check
Selecting the option Cancel the automatic operation of the controller for a short time, allowing the technician to see on the screen and in the field the response of the system to the "simulation" of the level switches in different modes of operation That is, how the system responds to an increase and a gradual decrease in the water level. At the end of the simulation, the system returns immediately to the automatic operation

Chapter 5 - Timers and Operating Settings

After pressing the "Set" button (F3) and entering the Technician Code as described in Section 3.2 above, the following selection options appear:

1. Pumps testing
2. Timers and operating settings
3. Non-essential settings

Selecting "Timers and Operating Settings" allows the technician to view and change:

5.1 Operating delays
5.2 Delays for malfunctions
5.3 Operation settings

Chapter 6 - Non-essential setting

After pressing the F3 button "Set" and the Technician Code as described in Chapter 3.2 above, the following option appears on the third line: "Non-Essential Settings."
Selecting this option allows the technician to view and modify:

6.1 Set clock
6.2 Set date
6.3 Communication settings
6.4 Language Selection.

Chapter 7 - System operation in automatic mode

7.1 Definitions

7.1.1 "On duty" pump - The controller automatically selects another pump at each operation in order to balance the working hours on both pumps, the "selected" pump called "on duty" pump

7.1.2 Non-"on duty" pump - If a failure is detected in the "on duty" pump, a non--"on duty pump" will be used. The non--"on duty" pump will also be activated if necessary to reinforce when the water level is high.

7.1.3 Level switch time delay - To avoid unnecessary pump operation, the controller will execute the command from the level switch only if the signal from the switch is in stable status for at list 5 seconds (this time can be changed by the user, see section 5.1).

7.2 Automatic level control
4 level-switches are connected to the controller and marked as L1; L2; L3; L4

L1 level switch (shut off level) installed at the lowest water level and used for system shutdown when the water level goes down and level switch L1 goes OFF.

L2 level switch installed higher than the L1 and its function is to activate the "on duty" pump. This is done in a delay after L1 has switched ON. L2 is also used to stop the non-"on duty" pump if it is in operation and the L2 is switched OFF.

L3 Level switch installed higher than the L2 and is used to operate the non-"on duty" pump when L3 goes ON.

L4 This Level switch is used for overflow alert. Moving L4 to ON will cause the alarm to sound, the alarm display on the controller screen, and in the controller alarms report with a date and time.

7.3 Operating a non-"on duty" pump.

The following are the situations in which a non-**-"on duty"** pump will be operated automatically:

.1   When an overflow signal received from L4.
.2   When the overheating signal received from "on duty" pump.
.3   When an "activation failure" occurs to "on duty" pump.
.4   When level switch (L3) is activated. (ON)

7.4 Possible system alarms.

In any situation defined as "alarm" an appropriate indication will be displayed on the display screen, including the description of the alarm that will be recorded in the alarm report, including the alarm time. An internal horn will be activated in the controller and an external horn will be activated for 5 minutes or until the horn is silenced.
Silencing the horn does not cancel the indication on the controller display

7 4.1.Overload alarm
As described above + Pump operation ..., the alarm will be canceled automatically when the fault is fixed.
7.4.2 Engine heat alarm
Indication as described above + shut off the pump with engine heat alarm + running a non-"on duty" pump, the controller will restart the pump after a specified delay (that can be changed) for engine cooling.

7.4.3"check valve" alarm
When running a pump, the check valve belonging to the pump must change the status to ON position , if the check valve does not change its position to ON (or OFF when the pump is turned off , A "check valve" alarm is recorded in the alarm report, a non "on duty" pump is activated and five attempts are made to turn ON the pump "on duty" again, if after 5 attempts still check valve remain in "alarm" mode, the alarm "locks" Fixed until the controller is initialized (as specified in Section 3.2 F2).

7.4.4 Overflow alarm

If the L4 level switch is activated after a delay of 5 seconds (can be changed), the "alarm" procedure will be activated as defined above.

7.4.5 L1 - shut off level switch alarm.

When a pump is working continuously for 30 minutes and the L1 is not switching "off" there is a risk that the L1 level switch is not working and an "alarm" procedure will be activated.

7.4.6 General level switches alarm

If the level switches are not activated in the correct order in operation L1> L2> L3> L4 and in reverse order L4>L3>L2>L1 a general level switches alarm will be activated

Chapter 8 - Communication

The pump controller communicates with computers and with building automation controller with RS485 serial communication and MODBUS and BACnet protocol open.

For additional technical details, please request the Technical Annex

" Elnet Communication XP"

In order to enable connection number of parameters must be defined.

The device address can vary from 1 to 255.

The communication speed can vary from 300Bps up to 57600 Bps, the speed usually determined by the amount of "electromagnetic ambient noise", the more the environment is noisy the it is recommended to reduce the communication speed. Following are the possible communication speeds: 300/600/1200/2400/4800/9600/19200/38400 BPS

Parity you must define one of the following two methods: NONE or EVEN

TCP / IP communication is available (option), please enter the required data as specified in the controller display.

See Chapter 2- 3 for instructions on how to enter the technician code.