

PC-200 Pump controller



User manual

Version 2.12.xx/-UK



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1 Description

1.1 General

The pump controller **PC-200** is an advanced computer controlled device to control and supervise up to 3 pumps. It is built up of a combined operator and I/O unit for connecting all digital and analogue signals used by the unit. The level in the sump is detected by a 4-20 mA level sensor (chapter 5.2.4), or by the use of level switches to start and stop the pumps (chapter 5.2.1).

The controller can handle a mixing device and has an integrated voltage supervision relay. The unit has one communications port RS 232 for communication with radio/PSTN modems or a GSM-modem to send SMS-text messages or to communicate with a supervision and SCADA system.

1.2 Operator unit

The operator unit is mounted in the front door of a cabinet and has 4 control keys for handling, configuration and alarm. There are 4 light emitting diodes for indication of alarms and status and an alphanumeric display with $2 \ge 16$ signs for displaying all information.

Front panel

Indication diode "P1-P3"



2 Log in – Access code

For looking at information about pumps, running times or alarm you can go directly to the actual information menus. But to make changes or acknowledge alarms a.s.o. you need to enter an access code depending of what you want to do. The unit is delivered with two different access codes:

1. Operator code – allows acknowledgement of alarms. The code is ZZZZ (▼▼▼)

2. System code – allows changes of for example start and stop values or configuration of the unit. The code is 0000 ($\blacktriangle \blacktriangle \bigstar$)

The access codes can be changed under "System settings"

When you enter a menu and want to change any value, the access code prompt will show when you press the OK key to enter the changing position. When the prompt shows up you set the actual code and accept with the OK key you enter the changing position and can make the changes you desire. The unit will automatically log out 5 minutes after the last time you pressed a key. If the function "Trusted logged in" is activated no log out will be made.



3 Menu overview

3.1 Main menu – Status windows, settings and alarm handling









Status menus

When in the normal standby mode the controller will show the actual level in the pump pit at all times. By pressing the down arrow $\mathbf{\nabla}$ you will have direct access to status windows which are organized in a loop, where, by each pressing of an arrow button you will see the next status window in the loop. In this menu you will find information about the level, pump and station status etc.

4.1 Start window (Level)

This is the window that is always displayed when the unit is in normal working mode.



If the up \blacktriangle arrow is pressed you will access the settings and alarmwindows in the main menu.

If the down $\mathbf{\nabla}$ arrow is pressed you will access the status windows in the main menu.

4.2 Analogue input 2 (Free choice)

Will appear only if analogue input 2 is activated and configured.

Actual value for the analogue input 2 is shown in the next window. As this input is editable regarding texts, units and scaling and will show the configured values.



More information under system settings page 21

More information under system settings page 21 **4.3 Voltage input** (phase measurement)

The voltage reading for each phase (Phase-N) will be shown if the voltage relay is activated and the corresponding wiring is done (three phases and neutral)



4.4 Attendance check (person- / intruder alarm)



If the attendance check function is activated, personal alarm or intruder alarm, in this window the status for the function is shown, on/off and the remaining delay time for the alarm to go active.



4.5 Pump status

In the pump status windows the information about all pumps is available. The first information window shows if pumps are running, and if they are in auto or not in auto. The following windows show the total values for operating hours and number of starts for each pump. This information is only available in these windows. Only pumps that are used are shown.

	▼▲					
P 1	P 2	P 3				
off	o n	on				
▼▲						
P1 0	p. h:	5				
P1 N	o s :	35				
▼▲						
P2 0	p.h:	5				
P2 N	o s :	35				
▼ ▲						
P3 0	p. h:	5				
P3 N	os:	35				
$\mathbf{\nabla}$						

Shows if the pumps are on/off. If the current measurement is activated when the pump is on the pump current will be shown. If the a pump is Not in auto this will be shown by the two vertical lines surrounding thepump number |P1|.

In the second pump status window the total operation hours and number of starts for pump 1 will be shown.

The following windows will show the corresponding values for pump 2 and 3, if used.

4.6 **Overflows** (only shown if overflow function is activated)

If the overflow switch function is activated, the total overflow duration and total number of overflows will be shown.



If the corresonding digital input for overflow detection is activated , this window will show the total duration of overflowing conditions and the number occured overflows.

4.7 Flow status

If the digital pulse counter input for flow is used, in these two windows you will see the actual instant flow and the accumulated total volume pumped.



The instant actual flow will be shown, according to the configuration of the digital pulse input for flow measured in m3/h or l/s.

The total pumped volume will be shown in m3/h.



5 System settings

The unit is delivered with a factory setting, for a fast start up of a pumping station with the most used functions activated. To adjust the controller to the application you need to configure and activate I/O s and functions according to the specific use.

The system setting menu is built up in logic split sub menus. When you enter system settings, 7 sub menus will be available.

In this part the description of how to enter the different submenus and how change values is made. During configuration of the unit it is convenient to follow the logical structure of the submenus



How to change values in the setting menus



How you move in the menues?

To move in the menues you use the $\bigvee \triangle$ keys. To enter a menu you use the **OK** key. To leave a menu you use the **Esc** key.

How to change values?

Move in to the menu window where you want to change a value and press the OK key. You will see the actual value with blinking grey square.

To change a value go up and down with the \checkmark \blacktriangle keys changing the numeric value or toggling between options, then press **OK** to accept the choice.

To leave a menu you use the **Esc** key.



5.1 Application

The pump controller PC-200 is made to control up to 3 pumps. In the application menu you set how many pumps the station has and how many of these pumps are allowed to run at the same time. The unit can be configured to control the pumps with only level floats.



When you are in a menu where you want to change a value you choose the parameter you want to change and enter the changing mode by pressing the **OK** key.

Now the cursor will flash in front of the value you want to change. Use the \blacktriangle kay to see the alternatives and accept wanted alternative with the OK key.



Menu - Application

Here you set how many pumps the station has.

Here you set how many pumps are allowed to run at the same time.

Here you set if the pumps are used for filling or emptying of pumpsump.

Here you set if you want the unit for advanced (all functions) mode or Basic (just the most

Advanced mode –

The advanced / not advanced mode is a mean to with just one simple settings change can convert an advanced pump controller with many functions, to a simple controller with only basic pump control functions.

Advanced mode -NO (Basic mode)

In Basic mode you will access the following basic functions:

- Start and stop functions for 1 to 3 pumps.
- Alternation of pumps
- Use of analogue level sensor or level switches
- Comunication and sending of SMS alarms
- One digital pulse counter for flow, energy or rain.
- Alarm handling with alarm history (up to 15 alarms).

Advanced mode –YES

In advanced mode you will access the following additional functions:

- One additional analogue input (free choice) with alarm set points
- Voltage relay
- Current measurement and/or running confirmation
- Inputs for the pumps termoswitches
- Mixer functions
- Attendance check



5.2 I/O Settings

The unit has following in and outputs:

- 10 Digital inputs
- 7 Digital outputs
- 1 Digital pulse counter
- 2 Analogue inputs (4-20 mA)
- 3 Voltage inputs
- 3 Current inputs (5 A current transformers)
- 3 Temperature protection inputs (digital)

All these In and Outputs are predefined for what they are used for, but you have to select if they are to be used or not, which shall generate alarms, signal delays, measuring ranges for analogue inputs etc. For a complete overview of all In and Outputs refer to the table in chapter 10.



5.2.1 Digital inputs

There are totally 10 digital inputs 24 VDC available according to the list below:

1-2 Pumps

DI1 P1 Not in Auto
DI2 P1 Motor protector
DI3 P2 Not in Auto
DI4 P2 Motor protector
DI5 Not in use
DI6 Overflow float
DI7 Low level float
DI8 High level float
DI9 Ext.Block/Ovf
DI10 Attendance check / Person alarm
<i>Note!</i> See chapter 5.4.5, page 33

3 Pumps

DI1 P1 Not in Auto
DI2 P1 Motor protector
DI3 P2 Not in Auto
DI4 P2 Motor protector
DI5 P3 Not in Auto
DI6 P3 Motor protector
DI7 Low level float
DI8 High level float
DI9 Ext.Block/Ovf
DI10 Attendance check / Person alarm
Note! See chapter 5.4.5, page 33

Each of these inputs has following choices to be set:

Function: in use / not in use -	You can choose not to use the input.	
Signal type: NC/NO	Here you specify if the input is NC or NO .	
	NC = normally closed and NO = normally open	
Alarm function	Here you specify if you want to generate an alarm or	
	not, Yes or No.	
Signal delay[s]:	This is a delay of the signal activation.	

Backup operation / Level switch operation

DI 7 low level switch and DI 8 High level switch can be used to start and stop the pumps;

- 1. If level sensor is used this function can be used as a security backup to start and stop the pumps if there is a problem with the level measuring.
- 2. If NO level sensor is used, the means of start and stop of the pumps will be with level switches. With the start switch the first pump in the alternation cycle will start and it will stop with the low level switch. If the level keeps increasing when the first pump is started (start level switch is still active) after predefined time (see 5.3.5 Max. time starts) a second pump will start, when the low level switch is reached the pumps will stop with a time delay between the stops (see 5.3.5 Min. time stops).

<u>Note</u>

If an alarm is activated this means that the alarm is sent either as an SMS message or to a SCADA-system

Alarm type not activated – if you choose not to activate an alarm, no alarm will be generated when an alarm signal goes active. If this is a signal which forces the pump to stop for ex. a motor protector or a temperature, it can be a little confusing that a pump has stopped but that there is no alarm. If you have configured an input this way you have to go to "alarm status" to find out why the pump has stopped.



DI 1. P1 Not in auto

A contact from the manual-0-auto switch is used to register when a pump is not in the auto position. When all pumps are in the auto position the AUTO diode will show a fixed yellow light. If a pump is not in auto position the Auto diode will show a blinking yellow light and the actual pump will be marked with | 1 | in the information window.



DI 2. P1 Motor protector

Signal indicates activated motor protection for the pump. This signal does not block the pump as the motor protector has to be reset manually externally.



DI 3. P2 Not in auto

A contact from the manual-0-auto switch is used to register when a pump is not in the auto position. When all pumps are in the auto position the AUTO diode will show a fixed yellow light. If a pump is not in auto position the Auto diode will show a blinking yellow light and the actual pump will be marked with | 1 | in the information window.





DI 4. P2 Motor protector

Signal indicates activated motor protection for the pump. This signal does not block the pump as the motor protector has to be reset manually externally.



DI 5. Not used / P3 Not in Auto

If only two pumps are set in the application setting this input will not be used and you will see "Not in use" text in the digital input 5 menu.

A contact from the manual-0-auto switches used to register when a pump is not in the auto position. When all pumps are in the auto position the AUTO diode will show a fixed yellow light. If a pump is not in auto position the Auto diode will show a flashing yellow light and the actual pump will show with |1| in the information window.



DI 6. Overflow / P3 Motor protector

Depending on if the application is for two pumps, the function for this input is Overflow input





When used as P3 Motor Protection the signal indicates activated motor protection for the pump. This signal does not block the pump as the motor protector has to be reset manually.



DRIP DROP

DI 7. Low level float

The low level float is used to signal low level or to stop the pumps if you have activated stop pump function. If the "stop pump" function is not used, only an alarm is given but the pumps will not stop.



DI 8. High float Overflow In 2 pump application thi input is only used for High level float

The high level float is used to signal high level and if the start pump option is activated, to start the pump. If you don't activate the "start pump" function only alarm will be given, but not start the pumps.



In 3 pump applications this input can be used either as a mgn noar mpur (as snown above)or as overflow input

If the input is used as Overflow input input it will measure when the stationis in overflow, number of overflows and total overflow time





 \blacksquare

DI 9. Block / Overflow

For2 and 3 pump applications this input can be used for external blocking of the pumps

External block is a signal input which will stop all pumps when activated with a built in delay between each pump.



Fot 3 pump applications this input can be used as Overflow input,(if DI8is used for High level float)

If the input is used as Overflow input input it will measure when the stationis in overflow, number of overflows and total overflow time



DI 10. Attendance check (the settings for this function are made under Station settings \ attendance check. chapter 5.4.5)



See further details in Station settings – Attendance check



5.2.2 Digital outputs

The pump controller PC-200 has 5 digital relay outputs which handle a max load off 6A at 250 VAC/30 VDC, and 2 open collector outputs 50 mA at 30 VDC. The configuration alternatives for the digital outputs are to set the signal type i.e. NO or NC signal on each output. Below you see an overview of the outputs and their predefined functions.

DO1 Pump 1 Start/Stop				
DO2 Pump 2 Start/Stop				
DO3 Pump 3 Start/Stop				
DO4 Mixer.				
DO5 Not ackn. Alarm				
DO6 Attendance (open collector)				
DO7 Modem control (open collector)				

DO 1. P1 Start/Stop



DO 2. P2 Start/Stop



The signal type is changed by pressing the OK key and change between NO and NC with the \blacktriangle key. Confirm with the OK key

The signal type is changed by pressing the OK key and change between NO and NC with the \blacktriangle key. Confirm with the OK key

DO 3. P3 Start/Stop



ΝO

NO

ΝO

The signal type is changed by pressing the OK key and change between NO and NC with the \blacktriangle key. Confirm with the OK key

DO 4. Mixer.



The signal type is changed by pressing the OK key and change between NO and NC with the \blacktriangle key. Confirm with the OK key

DO 5. Not ack. alarm



DO 6. Attendance



DO 7. Modem control



The signal type is changed by pressing the OK key and change between NO and NC with the \blacktriangle key. Confirm with the OK key

The signal type is changed by pressing the OK key and change between NO and NC with the \blacktriangle key. Confirm with the OK key

The signal type is changed by pressing the OK key and use the \blacktriangle key to change between NO and NC, confirm with the OK key.

For automatic switching off /on of the power to the modem



5.2.3 Pulse input

The unit has one pulse input, for flow, rain meter or energy

For this input you have to set the parameters for measuring unit, pulse unit,

scaling each pulse and set a pulse delay.





5.2.4 Analogue inputs (mA)

The unit has 2 analogue mA signal inputs 0/4 - 20 mA 24 VDC., one is for the level sensor and the other one is a free choice where you can edit the texts and units to needed conditions.

AI 1. Level sensor

Level sensor – which has an input of 0/4 - 20 mA, for ex. a DripDrop SP-25 submersible pressure sensor.



AI 2. Free choice

Other sensor - which gives a 0/4 - 20 mA signal, for.ex., Flow meter, DripDrop SP-25 submersible pressure sensor or a sensor for pressure, chlorine, pH etc.

The texts and units are free texts strings to be inserted as any parameter of your own choice.



The text for AI2 and for the units are edited in edit mode (press OK key), you scroll up and down in the character list with the up \blacktriangle and down \lor keys, and choose the character by pressing the OK key, the cursor then moves to next character position. When you have written your text you confirm the text by pressing the OK key.



5.2.5 Voltage inputs

The unit has a voltage relay incorporated that has to be connected to the corresponding inputs L1,L2,L3 and the installation neutral. The function then has to be activated by setting the voltage input function in, "in use" mode.

The voltage input is designed for a maximum input voltage of 400 Volts between phases and 230 volts between phase and neutral. If the installation uses a higher voltage than 400 Volts (phase to phase) a voltage transformer must be used at the input. The transformation rate used will be set in the transformation factor window for each phase.

Factor 1 corresponds to 400 volt input (ph/ph).

Factor 2 corresponds to 800 volt input (ph/ph) etc.

For the voltage inputs tonwork correctly the Neutral must be used. If no neutral exists you have to create a neutral with a voltage transformer

(For mor information check with local representative





5.2.6 Current inputs

The unit measures the current consumption for each pump P1, P2, P3 in one phase by the use of a X/5 Amp current transformer. As for the voltage inputs this function has to be activated and a transformation factor (rate) has to be given.



Normally the smallest ring transformers are rated 50/5 amps.

If a smaller than 50 amps. pump is measured, you will need to wind the phase power cable around the transformer coil in order to increase accuracy, the as shown in the illustration below. Each turn of the coil will lessen the rated current in to the transformer. See the following figure.



Figure 5.2.6 shows how one of the phases of the phases of the pump is fed around the transformer coil. For a 50/5 A transformer the following reduction in the measured input current applies: 1 turn will give a 25/5 amps. rate. (for a pump up to 25 Amps.) 2 turns will give a 12,5/5 amps. rate. (for a pump up to 12,5 amps.) 3 turns will give a 6,25/5 amps. rate.(for a pump up to 6,25 amps.)

Once the correct number of turns around the coil is applied, you need to calculate the total transformation factor.

You need to consider the transformer rate as well as the transformation rate for the winding around the coil. You calculate the transformation factor the following way:



The factor F = transformer ratio / (n turns + 1)

You need to take the transformer rate for (example 10) and divide it by (the number of turns around the coil + 1).

Example 3.

Measuring a 20 Amps pump. We use a 50/5 A. transformer where the transformer ratio is 10.

In order to increase tha accuracy of the measuring range we need to wind the powercable one turn around the tranformer coil.

F = 10/(1+1) = 5

Set the transformation factor in the PC 200 to 5.

Example 4.

Measuring a 10 Amps pump. We use a 50/5 A. transformer where the transformer ratio is 10.

In order to increase tha accuracy of the measuring range we need to wind the powercable 2 turns around the tranformer coil.

F = 10/(2+1) = 3.33Set the transformation factor in the PC 200 to 3.33.

Example 5.

Measuring a 5 Amps pump. We use a 50/5 A. transformer where the transformer ratio is 10.

In order to increase tha accuracy of the measuring range we need to wind the powercable 3 turns around the tranformer coil.

F = 10/(3+1) = 2.5Set the transformation factor in the PC 200 to 2.5.











5.2.7 Temperature protection.

The unit has one input for term contacts in the motor winding, for each pump which if activated, will stop the pump when the thermo contact is activated. When the term contacts function is used you have the option to choose for the pump to stop and be able to start again once the term contact is deactivated, or you can choose to block the pump which means that once the term contact is activated and the pump stops, it will not be able to start again until the term contact alarm is manually confirmed.





5.3 Pump settings

In the pump settings menu, all settings are made that directly deal with the pumps, start /stop levels, alternation of the pumps, current settings a.s.o. These settings are made for each pump that is used, but here only the settings for one pump (pump 1) are shown.





5.3.1 Start and stop levels



Start and stop levels – when the unit is used with analogue level sensor you will establish the start and stop levels corresponding to each pump.

Alternation P1 ◀◀ Yes Following choices, Yes and No

5.3.2 Alternation, running time and break time

Alternation – You can choose for each pump to be included in the alternation cycle or to work with its own independent start and stop level.

Maxruntime1[min]

Here the max running time of the pump is set

Max running time - To avoid that a pumps runs too long time during a pumping cycle you can limit the time the pump is allowed to run by setting a maximum time. When it is finished the pump will stop and the next pump in the alternation cycle start. This time is set in factory to 720 seconds.

MinbreaktimeP1[s] Here the minimum break time before start is set

Minimum break time - To allow a pump to cool after running you can set a min.break time before the pump can start again. This function can seem confusing because a pump will not start when you think it should.

Running confirmation

If running confirmation is used you know if the pump is running, if no confirmation is received the unit will send an alarm and try to start the next pump in the alternation cycle and eventually block the pump. This function uses the measured pump current (Current input) with the inputs I 1 to 3 activated.

Running confirmation can only be made when current transformers are used.



Following choices, In use and Not in use

Here the time is set before the confirmation is checked

NOTE see settingsMotor currents 5.3-4



5.3.3 Setting of motor currents

Measuring of motor currents is used to check if the current is within the normal range for the pump and to protect the pump from running dry, with clogged impeller or over currents. The settings that must be done are explained below.

(This function will only appear in the menu if the pump current inputs are activated 11,12 and 13.)



Block pumps – when an alarm for high or low current is activated, the pump is always stopped You can choose if you want the pump to remain blocked until the alarm is confirmed or not to block the pump and allow it to start next time it is activated in the alternation cycle without the alarm being confirmed.

Pump- start time – to avoid that an alarm is activated during start of pumps there is a start delay to allow the pumps to get into normal conditions for example when you use a soft start equipment.

Under current - the low current function is used to protect the pumps from working without fluid or with a clogged impeller which stops the pump from pumping fluid but does not stop the impeller from rotating

Over current - high current mostly occurs when the impeller can't rotate freely and therefor increases the current.



5.3.4 Times / delay for pumps

In this menu you set the times and delays which are general for all pumps and different functions in the pumping station.



Start delay– Signal delay for starts of pump when startlevel is reached, for ex when there is turbulance on the surface of the pump pit.

Stop delay– Signal delay for stop of pump at stop level.

Min. Time starts* – Minimum time between start of pumps.

Min. Time stops **- Minimum time between stop of two pumps.

Switch time – Time delay between stop of pump with fault and start of next pump in the alternation cycle

Backup running time *Level switch operation – when only level switches are used to control de level in the sump.*

Min time starts *Min. Time starts* is the starts time delay between the first and the second pump when the inflow is larger than one pumps capacity and there is need for a second pump to start.

Min time stopps *Min. Time stops* is the time delay between the stop of the first and the second pump when two pumps are running.



5.4 Station settings

All setting in this menu are general setting for the pump station .



5.4.1 Alternation type of pumps

The controller has two different ways of handling the alternation of the pumps:

- 1. **Cyclic** witch means that the pumps alternate in a cyclic way, one after another. This means that in the first cycle they start with pumps 1,2,3 and in the next cycle with pumps 2,3,1.
- 2. **Running time** which means that the pump that has the lowest running time starts first. This means that the pumps will have about the same running times.

The second setting decides if the next pump in the alternation cycle shall start when the working pump has an fault or not.

- if you set "**alternation on fault**" to Yes the next pump will start with a short time delay when the working pump has a fault.

- if you set "**alternation on fault**" to No the next pump will wait until the start level is reached before it starts.

5.4.2 Level alarm settings (Low and high level alarms)

In this menu the level alarms for the level sensor are set. These alarms only show how the levels in the station are, but control no pumps





5.4.3 AI 2 Setpoints, Analogue setpoints

For the Analogue input 2 which is a free choice/editable function adabtable to your specific needs to measure analogue signals, pH, conductivity, flow etc.

For this signal you can set a high and a low set point which can be used to generate alarms for example.





5.4.4 Mixer settings

In bigger stations a mixing device must be used to keep the pit clean. To install a non clogging mixer device is recommended.

For the mixing function the controller has two separate forms of controlling the mixing device.

- 1. **Start by level and stop by timer** during filling or emptying of the pit and stopping by a timer. With this option you might set the function to start during filling phase (before pumping) or the emptying phase (while pumping). The criteria of the frequency of the mixing is by setting number of pumpcycles between mixing starts. The stopping of the mixing is made by setting the running time by a timer.
- Start and stop by timer in this option you will set an idle time and a running time for the mixing device. It will start at the elapsed idle time and keep running for the set operation time. With this option the mixing will operate independent of the level in the pit. To avoid the mixing while pumping (important at large flows) there is a function where you can block the mixer while the pumps are ON.





5.4.5 Attendance check (Person alarm or Intruder alarm)

Personalarm/ Intruder alarm- to create a signal an analoge input is used which is changed to a digital signal by connecting an resistor in series with the analogr signal

Person alarm

For the function *person alarm* the input is activated via a signal cable that is connected to the light switch in the station and starts an internal timer which after a set time activates a relay output. This output can for example be connected to a horn or flashing light to inform the operator that the operator time is finished and has to be prolonged. If this is not done a person alarm will be sent . To avoid that this happens the light switch has to be turned off and on.



Intruder alarm

The function *intruder alarm* is activated via a signal cable that is connected to for ex. a magnetic sensor in the door and starts an internal timer which is set to after a certain set time activates a relay. This relay output can be connected to a horn or flashing light and send an intruder alarm. To avoid that the alarm is sent a password must be entered on the keyboard.

Attendance check► ◀	Intruder alarm	Choice between person alarm, intruder alarm and none
	V▲ signaltype ∢	Choice between NC and NO
	V▲ Cont.signal ∢∢ No	Choice between Yes and No
	V▲ Logintime[s] ∢∢ 0	Time before alarm is sent when opening the door
	V▲ Logout time ∢ ◀ 0	Time before alarm is sent, when the password is keyed in and door not closed



5.5 Voltage relay

If the phases are connected to the phase inputs of the unit the voltage, phase rotation, undervoltage, overvoltage, unbalance and missing phases are checked. If the functions are activated the pumps can be blocked if wanted and alarm given.

Nominal voltage-You will need to set the nominal voltage to be used in the installation, meaning the real installation voltage i.e. 230, 400, 660 V. You must set the nominal voltage as the **phase to neutral** value.

Failbreaktime – When the voltage relay detects a failure in the power supply, and the pumps are blocked, the unit will hold the operation of the pumps on hold for a time – **the fail break time** – the idea of this timer is to allow for the power supply to re-establish to stable conditions before the pumps are put back to operation.





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Voltage relay cont.



Signal delay

10

• •

Here the signal delay time is set



5.6 Miscellaneous

Under miscellaneous settings are the settings for communication, log-in, clock setting, default settings, erase alarms, erase counters, erase runtimes and contrast control found.

5.6.1 Communication



Connection settings

Next step after the communication parameters is the connection settings . Which type of communication equipment is to be used and what settings have to be made for the equipment to work correctly. Communication alternatives are:



Direct (Fixed cable or radio)

The direct communicationen is the simplest way to communicate as communication is always available.





Dial-up (PSTN/Fixed telephony or GSM-modem)

Dial-up communication means that the connection between the units is made via a dial-up function. This is done trough a telephone or GSM. This type of communication needs a modem for normal telephone or a GSM modem. When modemtype is selected certain parameters must be set for the modem to work correctly.





GSM-SMS (SMS-text via GSM-modem)

These settings are used to send and receive SMS messages with a GSM telephone. You need a normal SIM card with the SMS function activated. The PIN code of the SMS card can be activated or not. The function allows up to three different mobile phone numbers to be activated. Depending on the settings SMS messages can be sent to all phone numbers with a certain time delay.



GSM Signal strength

This is an status window which shows the actual signal strength in the GSM net if you selected to Communicate via a GSM modem. If you selected any other type of communication this menu will no apear



Shows actual signal strength.



5.6.2 Trusted login

You have the option to set the unit to work with different log-in modes. The default factory setting is that you need to log in whenever a change is made or an alarm is confirmed.

However, if preferred the unit can be set to always be logged-in for system privileges or to always be logged-in for operator privileges.



This menu is shown only if you are logged in with system code. Choice between system, operator or none

5.6.3 Operator password

To change the passwords you use a combination of the four arrow keys .



To change the system code press OK key and the cursor will be placed on the first position which shall be changed, set new value, press OK to confirm. The cursor moves to next position. $\blacktriangle \blacklozenge \blacklozenge$

5.6.4 System password



To change the system code press OK key and the cursor will be placed on the first position which shall be changed, set new value, press OK to confirm. The cursor moves to next position $\mathbf{\nabla \nabla \nabla \nabla}$

5.6.5 Clock setting



To change the clock setting press the OK key and the cursor will be placed on the first position to be set. Set value and press OK to confirm. The cursor is moved to next position.

5.6.6 Default settings

Resets the controller to normally used pumpstation applications, The prompt "Are you sure" is shown and must be confirmed with the OK key.



To change to default settings press OK key



5.6.7 Erase alarms



5.6.8 Erase counters



To erase the totaliser for the pulse inputs press the OK key.

5.6.9 Erase runtimes



5.6.10 Contrast



To change the contrast, press \blacktriangle for increasing contrast and \triangledown for decreasing contrast. Press Ok to confirm.

5.7 Login / Logout

As an alternative to login when prompted so when making any changes of values or confirming alarms, you can start your working session by login in, in this menu.





Login by introducing the correct password and press the OK key



6 Level settings

For an easier access to the set the different levels there is a specific level settings menu where will set the start and stop level for the pumps as well as low and high levels alarms.



Here you set the start och stop levels for the pumps and the level for low and high alarm

7 Manual start and stop of pumps

When the pumps are in Auto mode they can be started manually from the PC 200, this is the menu where you can start and stop pumps manually.

You will be able to start and stop all used pumps, if they don't have any active condition that prevents them from starting, alarms low level etc.



The pumps can only be started if the actual level is between the start and stop level settings.

The pumps are started and stopped by pressing the OK key.



8 Alarm status

The pumpcontroller has the capacity to generate a large number of different alarms for the pumps, the station and internal alarms. Each of these alarms generates an information window when activated, with information about which alarm it is. At the same time a LED with blinking light is activated until the alarm is acknowledged.

Red blinking light means a new alarm which is not acknowledged. Fixed red light means an alarm which has been acknowkedged but still is active.

8.1 Alarm handling

When you want to look at the alarms or acknowledge them you need to enter the alarm status menu, depending on the status of the alarms, Not Acknowledged alarms (new alarms), Active alarms or No new alarms you will enter one of the three submenues as below. To enter and see all alarms (alarm history) you press the \checkmark key, and the OK key.



8.2 New alarms

When there is a new alarm activated, you will by default enter the Not Ack alarms section of the alarm handling. Here you can easily acknowledge all new alarms by using the OK key. If you choose not to acknowledge but only to look at all new alarms you will go up and down in the not ack alarm list with the $\blacktriangle \nabla$ keys.







8.3 Active alarms

When there are new alarms to acknowledge you will by default enter the Active alarms section in the alarm handling. Here you can see all active alarms one by one using the OK key, once you have gone through all active alarms you will return to the Active alarms menu.



8.4 All Alarms

In the all alarms list you can look at all registered alarm events, active, not active, acknowledged and not acknowledged alarms.



When you enter all alarms you enter a list of all registered alarmevents, where you can se all alarms one by one. The \bigvee Arrow in the display means that you are at the top of the list and that there are older alarms to watch in the list. A \blacktriangle arrow means that you are at the bottom of the list and that all other alarms in the list are newer than this alarm. $\bigstar \bigvee$ arrows means that you have both newer and older alarms in the list than the one you are looking at. The $\sqrt{\text{ sign in front of the alarm means that the alarm is acknowledged, and an not acknowledged alarm still has the acknowledge prompt attached to it.$

If you press the OK key when looking at an alarm you will access the information of the time when the alarm occurred, when it went unactive and when it was acknowledged. The alarm that shows first in the list is the latest occurred alarm.

Alarm history

In the alarm list for active and all alarms totally max. 8 alarms can be stored. When the alarm list is full the oldest disapears.



9 SMS-functions - use of mobil phone

With the function to send SMS activated you can send SMS messages , acknowledge alarms and receive information from the PC 200 about the alarms and values about pumps and if they are running or not

9.1 Alarm by SMS messages

When an alarm is generated in the PC-200, a text message is sent by the connected GSM modem to the established phone list. The modem will send an SMS text alarm to the first mobile phone in the telephone number list (maximum 3 numbers), the message will have the following format:

(005) Main Station
Alarm pump 1
Over current
(1)

In the mobile phone you will se the following about the alarms: -The internal alarm number -Pumpstation name -That it an alarm from pump number 1 -Alarm name.

For the settings on how to send the SMS messages see chapter 5.6.1.

9.2 Remote confirmation of the alarms

Once you have received an alarm message on your phone and you have activated the remote confirmation function, you will confirm the alarm remotely by returning the same alarm text to the PC-200. Depending on the mobile phone there are different ways of doing this. But the important is to send back the same message that you have recieved on the phone.

Once the PC-200 receive your return SMS message, the blinking Alarm lamp will stop blinking as an indication of that the alarm is confirmed.



When receiving an alarm sent by the PC 200, return the same message to the PC 200, and the alarm will be confirmed remotely



9.3 To ask questions via SMS texts

In addition to receiving SMS-alarms from the unit you can send questions for further detailed information as shown below.

- 1. Information about active alarms
- 2. Information about pump status, time and number of starts
- 3. Information about actual values in the station, level and running or stopped pumps.

1. Information group (Alarms)





10 I/O-list, Signal table

Upprättad av Datum - Date		Datum - Date	Dokument Nr	Rev					
Prepared by				Document No.					
Contaktperson yy-mm-dd			yy-mm-dd		А				
Referens	/ Object:	:		Tillhör referens - File/F	Tillhör referens - File/Reference				
Comp	any / S	Statio	n name	PC-200 - Progra	amversion: 2.12.1				
	·								
I/O no		Sign	al type	Signal function	Notes				
DOI	17//18	Start	/Stopp P1	NO					
DO2	19/20	Start	/Stopp P2	NO					
DO3	21/22	Start	/Stopp P3	NO					
DO4	23/24	Mixe	er	NO					
DO5	25/26	Not a	acknowledged alarms	NC					
DO6	27	Atter	ndance alarm	NO					
DO7	28	Mod	em control	NO					
DI 1	29	P1 No	ot in Auto	NC	Most times NC				
DI 2	30	P1 M	otor protector	NO					
DI 3	31	P2 No	ot in Auto o	NC	Most times NC				
DI 4	32	P2 M	lotor protector	NO					
DI 5	33	P3 No	ot in Auto	NC	Most times NC				
D I6	34	P3 M	otor protector	NO					
DI 7	35	Low 1	evel	NO					
DI 8	36	High	level / Overflow	NO					
DI 9	8	Extern	nal blocking / Overflow	NO					
DI 10	12	Atten	dance check	NO					
L1	1	Voltag	ge phase L1						
L2	2	Voltag	ge phase L2						
L3	3	Voltag	ge phase L3						
Ν	4	Neutr	al for voltage and current						
I1	5	Curre	nt input P1						
I2	6	Curre	nt input P2						
I3	7	Curre	nt input P3						
T1	9	P1 Te	mp. protection	NC					
T2 10 P3 Temp. protection		NC							
T3 11 P3 Temp. protection		NC							
CI 37 Pulse input (Counter)									
AI 1 13 Analogue In (0/4-20 mA)			Analogue input						
AI2	2	Analo	gue In (0/4-20 mA)		Free choice Analogue input				



11 Configuration table

Application type	No of pumps	
	Max No of working pumps	
	Emptying/filling	
	Advanced mode	

Digital inputs

No	Туре	Function	Signal Type	Alarm function	Delay
DI1	P1 Not in Auto				
DI 2	P1 Motor protector				
DI 3	P2 Not in Auto				
DI 4	P2 Motor protector				
DI 5	P3 Not in Auto				
DI 6	P3 Motor protector				
DI 7	Low float				
DI 8	High float / Overflow				
DI 9	Ext Blocking / Overflow				
DI 10	Attendance check				

Digital outputs		Signal
DO 1	Start/Stop P1	
DO 2	Start/Stop P2	
DO 3	Start/Stop P3	
DO 4	Mixer	
DO 5	Not ack. Alarms	
DO 6	Attendance Alarm	
DO 7	Modem reset	

Counters

		1 Puls	Max delay.
CI1	Pulse inputs(Counter)		

Analogue inputs

		Signal	Range 0/4 mA	Range 20 mA
AI 1	Level Sensor			
AI 2	Free choice			
1	P1 Motor current			
12	P2 Motor current			
13	P3 Motor current			
N	Neutral for Current and Voltage			
L 1	Voltage phase L 1			
L 2	Voltage phase L 2			
L 3	Voltage phase L 3			



Pump settings

		Pump 1	Pump 2	Pump 3	
Day levels	Start[m]:				
	Stop[m]:				
Alternation	Yes / No				
Max. Runtime	[min]:				
Min. Breaktime	[sek]:				
Running confirmation	Function				
	Conf. time [s]				
Current setting	Block pump				
Under current	I-min[A]				
	Alarm delay [s]				
	Alarm function				
Over current	I-max[A]				
	Alarm delay [s]				
	Alarm function				
Times / Delays	Start delay [s]:				
	Stop delay :[s]				
	Min time starts[s]:				
	Min time stop [s] :				
	Switching time [s]:				

Station settings

Alternation	Туре:		
	Alt. on fail:		
Alarm levels	High level alarm	Set point[m] :	
		Signal delay [s]:	
	Low level alarm	Set point[m] :	
		Signal delay;	
Mixer Level type	Emptying/Filling	Start cycles	
		Start level	
		Start delay[s]	
		:Runtime[s]	
Timer type		Start after[h]:	
		Runtime [Min]:	
		Block if Pump is running	



Miscellaneous

Operator password			
System password	• • • •		
Settings RS 232	Communication sett.	Baud rate:	
		Parityt:	
		Stop bits:	
		Protocol:	
		Communication ID:	
		Station ID:	
	Conections.	Link:	
		Modem reset[m]:	
		Reset pulse[s]:	
		Hayes:	
		PIN code:	
		Tel no1:	
		Tel no2:	
		Tel no3:	
		Stn:(Stationsnamn):	
		Remote ackn. Ja/Nej	
		Ackn. time SMS[x10s]:	
		*Idc: (Stationsnamn)	
		*Answer after:	
		*Alarm resend no:	
		*Retry time[s]:	
		*Call alarm OFF	

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12 Menu structure – Settings





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System settings





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Systemsettings









System settings





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System settings

Station settings









System settings







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System settings

Miscellaneous







System Password is 0000 (Zeros) (**A A A**)







Notes