

IB INTERNATIONAL Pty Ltd



OCMIS INSTRUCTION MANUAL



AQUA SYSTEM 3



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INTRODUCTION

AQUA SYSTEM 3 is a computerized electronic instrument applicable to self-propelled irrigating machines. It automatically executes the following programmable functions:

- Measurement of unwound hose in mets or ft.
- Calculation of necessary work time, continually updated.
- Program Options :
 - Programming start timer
 - Programming a cycle end timer with outlet valve or closing valve (option).
 - Programming working speed.
- Chance of updating the programme with no need of changing electronic components.

MAIN SYSTEM COMPONENTS

1. Computerized electronic control unit.
2. Inductive sensor placed next to the driving pinion for speed reading.
3. Electric gearbox installed to turbine by-pass or to oil diverter valve for motor-driven machines.
4. Solenoid valve controlling the outlet valve.
5. Electric actuator controlling end of work.
6. 12 Volt 50 AH battery.
7. Solar panel (option) for battery charging.

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GETTING TO KNOW THE AQUA SYSTEM 3



ON / OFF Key.



Start work cycle.



Stop machine during work cycle.



+ key to choose programmes and increase flashing values during programming.



- key to choose programmes and decrease flashing values during programming.



Key to access programming value and display.

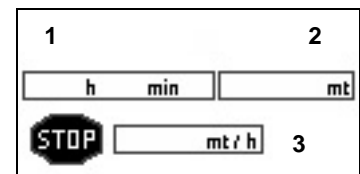


Manual key to manually control the by-pass

Aqua System 3 Monitor

The Aqua System 3 Monitor displays measurements according to the function being executed.

1. Working time.
2. Unwound hose, in mets or ft.
3. Working speed in mets. / h or ft / h.

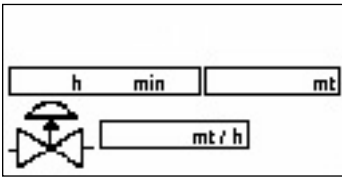


Start Up

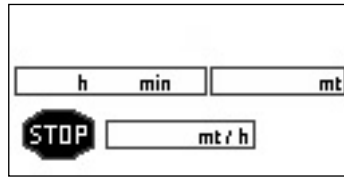
Ensure computer is switched on before pulling the hose out.

Ensure the correct number of metres pulled out are shown on the computer. **IF NOT CORRECT, DO NOT USE.** Correct the metres before the gearbox is used. **The Gearbox can be damaged if not correct.** It also displays STOP - WINDING - MANUAL - MANUAL in automatic operation - CLOSE VALVE - CLOSE BY-PASS status.

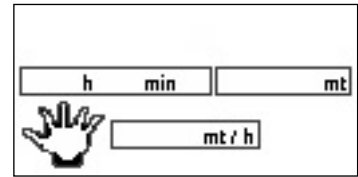
OPEN VALVE



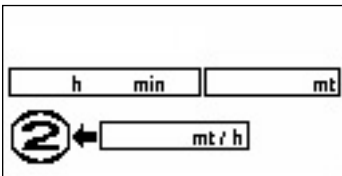
STOP



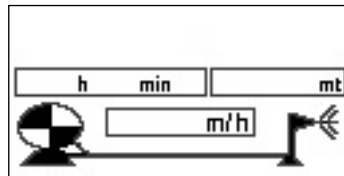
MANUAL



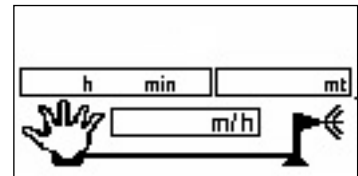
WAIT CLOSING 2



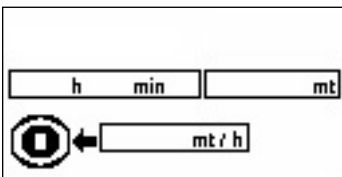
WINDING



MANUAL in auto operation



BY PASS OPENING



SWITCH ON

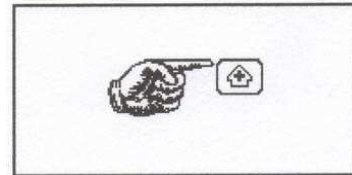
Switch On

Press the On/Off key to switch equipment on. The LCD displays the OCMIS – AQUA SYSTEM 3 logo for a few seconds. **The number to the right of the logo indicates the version of software used.**

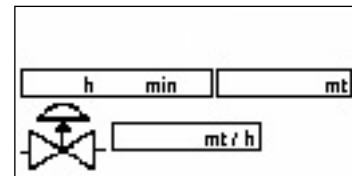


Press Inc

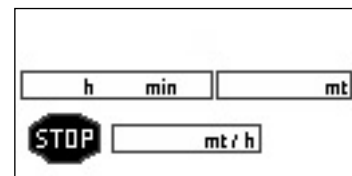
Press this key to open valve and display Stop Status.



Open Valve



Page: Stop Status



Using the Programming Keys




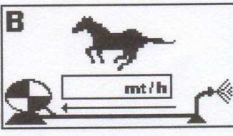


The PROG key is used to enter the programming pages and confirm the settings. + and - keys are used to increase and decrease the flashing figures.




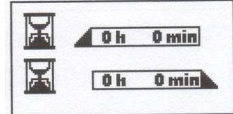


WORKING PROGRAM





Choosing the Work Program

Instruction			
Use + and - keys to increase or decrease set value. Press PROG to confirm set value and go to Timers for Start/Stop, and then to Stop Status Page.		 	




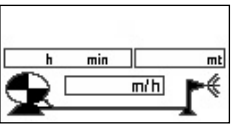
Start and Stop Timer

<p>Program start timer with trolley stopped. Use + and - keys to set time, or leave time to zero if you wish to have the machine start immediately.</p> <p>If you wish the outlet valve or closing valve (option) to trip with a certain delay at cycle end, use + and - keys to set wished time, or leave time to zero if you wish to have the valve trip immediately at work end.</p>		 	
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Page : Stop Status

In this position, if all operations have been performed correctly, press START to start the work cycle.		 	
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Page : Winding Status

Once START has been pressed the work cycle starts and it will be possible to read in the monitor the working time, the winding speed and the metres (feet) of unwound pipe.		 	
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Start Timer




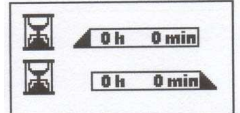
		 	
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Stop Timer

		 	
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START AND STOP TIMER

Start and Stop Timer

<p>Program start timer with trolley stopped. Use + and - keys to set time, or leave time to zero if you wish to have the machine start immediately.</p> <p>If you wish the outlet valve or closing valve (option) to trip with a certain delay at cycle end, use + and - keys to set wished time, or leave time to zero if you wish to have the valve trip immediately at work end.</p>		 	
---	---	--	---

Start Timer


		 	
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Stop Timer

		 	
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ALARM MESSAGES

Alarm Messages are displayed at the centre of the LCD in case of machine malfunction.

Alarm message can be deleted from display by pressing  after having eliminated its cause. Every alarm refers to the following codes:

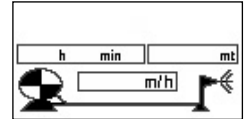
1. Battery voltage below 8 Volts
2. Short-circuit on external power supply.
3. Speed alarm.



CHANGING PROGRAMME DURING OPERATION

Aqua System 3 allows you to change programmed working parameters even during operation. Change parameters as follows:

1. The monitor displays machine winding status.
2. Press PROG: programmed priority is displayed.
3. Press + and - keys to set new value.
4. Press PROG to confirm and go back to machine winding status page.



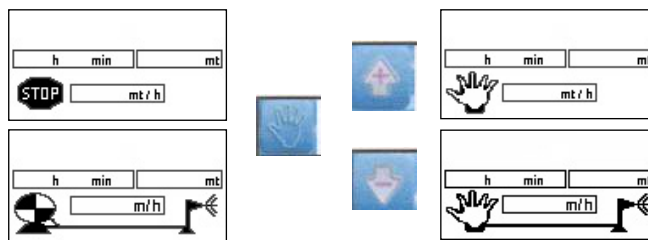
The equipment will automatically set to new program and correct all parameters.

ADDITIONAL FUNCTIONS

Manual Function

This function allows you to manually pilot the turbine by-pass so as to check (with machine running) the minimum and maximum speeds the machine can reach when engaging the various speeds of the gearbox. It is possible to use the Manual Function in two ways:

1. Machine Stop Status.
2. Machine Winding Status.
3. Press Manual Key.
4. Press + to increase speed or - to decrease it. In this way you change turbine by-pass opening or closing and therefore the speed.
5. Press Manual key again to go back to Machine Stop or Winding Status page.

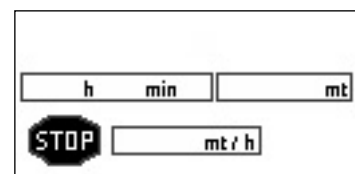


Note: Speed value is calculated and refreshed once a minute. To see the current speed you should wait at least 1 minute.

Manually Entering the Unwound Metres of Hose

When hose is laid down with computer off or with limit switch tripped, unwound metres of hose are not calculated. Manually enter unwound Metres of hose as follows:

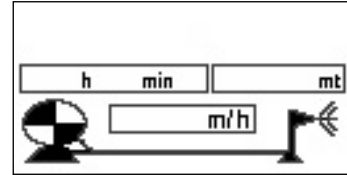
1. The machine should be STOPPED.
2. **Press + and - keys at the same time.** The number inside met or ft box will be flashing, then use the + and - keys to enter unwound hose length.
3. Press + and - keys at the same time to confirm. Entered figure will no longer be flashing.



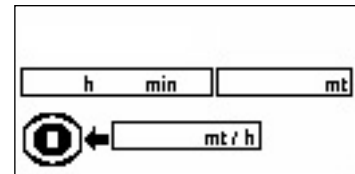
END OF WORK

When machine gets to the end of working run, the gearbox is automatically set into neutral, and the limit microswitch is pressed. The LCD will then display:

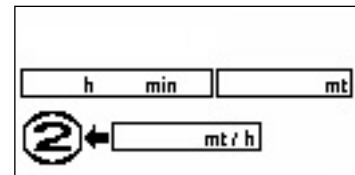
A. **Final pause** in minutes, is enabled.



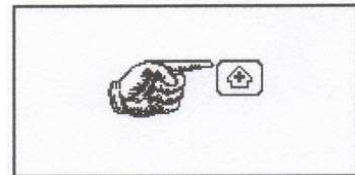
B. **Wait speed 0:** the control unit opens turbine by-pass or closes oil diverter valve (only for machines with motor-driven hose winding).



C. **Wait closing 2:** the outlet valve opens or the closing valve closes, if fitted.

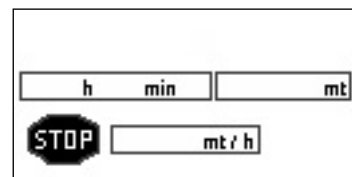


D. The LCD will display the symbol of a hand and + key.



Press  and Stop is displayed.

The machine is now ready for a new working cycle.
After 10 minutes the AQUA SYSTEM 3 will automatically off.



switch

ADDITIONAL FEATURES / TROUBLE SHOOTING

A. The machine starts very slowly if I press START. After 11 minutes the monitor displays alarm 4.

Set potentiality value is too high. Correct it.

1. Press - key to delete alarm from LCD.
2. Hold down PROG key to enter the parameter page.
3. Press PROG up to Potentiality (flashing) value Pt.
4. Press - key and decrease the value, such as 150.
5. Press PROG again key and go back to machine winding status page.

B. While working, the machine sets to security mode and the LCD displays alarm 4, ie Speed fault.

1. A wrong speed is engaged for the type of program set. Change speed and reprogram.
2. The sensor reading speed does not output the correct value. Check for proper operation.

Verify that the sensor is mounted properly and is approx 6 mm from the pinion gear on the reel. Slowly wind the reel so that the yellow light-ray illuminates from the back of the sensor when it passes a gear tooth and in between each tooth the light-ray goes off. Having tested these two items, you are now ready to use the machine.

C. While working, the LCD displays alarm 1, ie Battery fault

1. Battery voltage is below 8 V. It is necessary to charge the battery.

Note: The battery shall be charged with correctly set battery charger and for 24 hours. Battery will IRREPARABLY damaged if charged with battery charger set at maximum value.

D. While working, the machine does not settle working speed, ie speed continuously increases and decreases.

1. A program requiring high speed was set (100-200 m/h) and the equipment is set to a low potentiality value. Increase potentiality value (see pos A).

E. The machine ends working cycle but the LCD displays alarm 4, ie Speed fault.

1. Too high a speed is engaged with respect to the programme set.
At work end the equipment completely opens the turbine by-pass but speed is higher than programme set. Press – key to delete the fault and change speed.
2. If measured winding speed is 0 and No pressure alarm is not displayed, the equipment automatically closes turbine by-pass to reach the programmed speed.

If the problem persists for more than eleven minutes the machine alarm trips and machine sets to Stop. Check the causes, that might be:

1. Turbine jammed
 2. Trolley jammed
 3. Insufficient pressure
- CONT'D OVER PAGE

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4. Sensor faulty
5. Sensor cable torn off
6. Battery flat

Fix the problem, press - key to delete alarm from LCD and press Start to restart the machine.

F. The Computer Does Not Read The Feet (Meters) Unwound, Working Speed, And Accelerates To The maximum Speed

- a) The sensor is too far away from the pinion gear (move closer).
- b) The sensor light ray is always on, the battery falls under 10 volts (recharge), or grease on the pinion gear (clean off).

G. The Computer Does Not Regulate The Working Speed

- a) Verify if the motor that regulates the by-pass motor works correctly.
- b) Check to see if turbine has foreign object inhibiting the by-pass.

H. The Computer Does Not Regulate The Speed - It Accelerates When It Should Reduce The Speed

The electrical wires that go to the by-pass motor are reversed - switch wires.

IRRIGATION END

At the end of the work stage (once stop timer has timed out, if programmed) the machine can end irrigation in two ways:

1. Opening the outlet valve by controlling the solenoid valve.
2. Closing the throttle valve by controlling the electric piston.

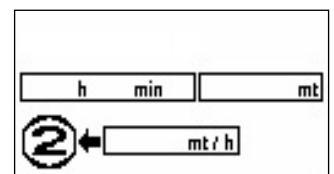
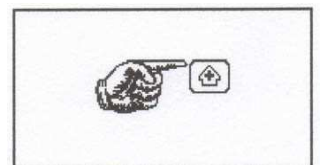
OPERATING FAULTS AT WORK END

Outlet Valve Does Not Open

A. The solenoid valve is jammed with a foreign body. Open and clean it.

B. The outlet valve control piston does not close:

1. The control unit is set for outlet valve. Only one electric pulse is sent to piston and the LCD displays Press +. It is necessary to set the correct function from parameters. Press PROG to enter the program and choose M2-1 for outlet valve, M2-0 for closing valve.
2. The status page displays wait closing 2 but electric piston does not close. In this case the piston is jammed or damaged. Remove jamming or change it.



WARNINGS

1. Never let the battery get completely flat. It will damage if charge gets below 9 volts.
2. At the end of the season remove the battery and periodically charge it.
3. When assembling the battery, check the wire connections. The equipment might damage if they are reversed.
4. Do not carry out any welding operations on the machine when it is powered or it might damage.

INSTRUCTIONS FOR USE OF THE BATTERY

Warning:

Consider that electrolyte is a solution of diluted sulphuric acid. Wash with abundant water if it gets in contact with your skin.

In case of contact with your eyes, wash with water and contact a doctor with no delay.

All batteries issue flammable gasses while charging. They might cause battery explosion.

Precautions:

Battery installation:

When assembling, removing, inspecting, starting with temporary connections and with auxiliary batteries or equipment, keep away from sparks and fire. Do not smoke.

Battery Charge



Battery charge on bench. Ensure to correctly connect the battery to battery charger (+ with + and - with -). Charge the battery in a well-ventilated room. Use not too high current and keep away from sparks or fire. Do not smoke close to the battery.

Never set metal tools on to the battery.

Keep away from children.

PROGRAMMING THE MAIN PARAMETERS

Programming is usually performed in-house, but user can gain access to this section to check or edit values if needed.

<p>After switch-on, when Press + is displayed, hold down PROG until parameter page is displayed. It is possible to enter the parameter environment, even from status page.</p>		
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Parameter Page

Use PROG + and - keys to set:

- um: unit of measurement
- ton: time (sec) of piston pulse
- toff: time (sec) o pulse-to-pulse pause
- step: number of pulses to output to piston
- pt: potentiality
- m2: set 1 for outlet valve
set 0 for closing valve
- imp/l: set used litre counter value



um	ton	toff	step
0	20	80	23
Pt	m2	imp/l	
80	1	9,0	

Type of Structure

Press + and - keys to display and choose the type of structure used.



Data of Structure Chosen

It is possible to enter hose length, ovalization and hose diameter.



	350	mt
	866	1/1000
	110	mm

User Structure

If the “user” structure used, it is possible to enter: roller width and diameter and number of teeth of rack.



	0	mm
	0	mm
	0	

- Um: Unit of measurement
Set 0 to measure in metres
Set 1 to measure in feet

Ton - Time (sec) of pulse to piston. If time is decreased, stroke is shorter and closing movement is slower.

Toff: It is time (sec) of pulse-to-pulse pause.

Step: It is the number of pulses to be sent to piston

Pt: Potentiality.

- M2: Set 1 for outlet valve
Set 0 for closing valve.

Imp/l - 9.0 pulses/l is the standard setting. Set the value according to used litre counter.

um	ton	toff	step
0	20	80	23
Pt	m2	imp/l	
80	1	9,0	

AQUA SYSTEM 3 PROGRAM CODES

Codes to be recorded in the computer

Structure	Code	Hose Diameter	Hose Length	No of Wraps	Reel Diameter	No of Teeth	Reel Width
MR 40	0	40		14	660	142	580
MR 43		43		13	800		
MR 50		50		11			
MR 58		58		10			
MR 63		63		9			
MRR 50/230	0	50		14	750	142	725
MRR 58/120		58		11			
MRR 58/200		58		11			
R1AT15	0	50		14	1030	142	720
		58		12			
		63		11			
		70		10			
R1/1A	0	63		14	1030	175	1020
		70		13			
		75		12			
		82		11			
R2A R2/1A(90-350)	0	70		15	1260	175	1140
		75		14			
		82		12			
		90		11			
R2/1A	0	75		14	1415	175	1140
		82		13			
		90		12			
		100		11			
R2/1B	0	100/300		11	1415	175	1240
R3A R3/1A IR1A	0	82		15	1520	228	1360
		90		14			
		100		12			
		110		11			
R4A IR2A	0	90		14	1700	228	1360
		100		13			
		110		11			
		125		10			
VR5 VIR5	0	100		16	1860	1254	1600
		110		14	1700		
		120		13			
		125		12			
		135		11	1860		
		140		11			

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Structure	Code	Hose Diameter	Hose Length	No of Wraps	Reel Diameter	No of Teeth	Reel Width	
R4/1A IR2/1A	0	100		15	1860	262	1540	
		110		13				
		120		12				
		125		11				
VR6 VIR6	0	110		14	1880	1254	1600	
		120		13	1970			
		125		12				
		135		11	1880			
		140		11				
R4/2A IR2/2A	0	100		15	1860	262	1540	
		110		13				
		120		13	1970			
		125		12			1560	
		135		11	1860			
		140		10				
VR7 VIR7	0	110		14	1880	1364	1600	
		120		13	1800			
		125		12				
		135		12	1800			
		140		11				
		150		10	2040			
R5/1A IR3/1A	0	100		15	1910	248	1560	
		110		13				
		120		12				
		125		11				
		140		10				
R5/1A IR3/1A 125/550 125/600	0	125		11	1800	248	1560	
IR4M	0	125		11	1800	408	1560	
		135		11	1910			
		140		10				
		150		10	2040			
IR4/1 IR4M/1	0	110		13	1910	460	1560	
		125		11				
		135		11				
		140	550	10				
		140		10				2150
		150		10				
		150	540	10				1910