

Nortoft Electronic A/S

Sejrupvej 38 · Sejrup · DK-7323 Give · Denmark

Constant Rain 7 Version 4.5
Direction for use 1 – 1 – 04.

Features:

Speed regulation	Charger on/off	Slowly start of turbine
Pre- and post-irrigation	Pressure sensor	Slowly opening for inlet of water
Total irrigation time	Stop sensor	Meter or foot
Length of the pipe	Speed sensor	
Actual speed	Motor 1, regulation motor	
Battery voltage	Motor 2, stop motor	

DISPLAY

SPEED	30.0 M/h
TIME	00:00
DISTANCE	000
PRE. 00	POST .00

Standard readout

TEST 1	
A. SPEED	030 m/h
BAT. VOLT .	12.3 V
CHARGE	ON

Press the key TEST 1 time for showing the first test menu

TEST 2	PRESS	■
STOP SENSOR		■
SPEED SENSOR		■ ■
MOTOR1	MOTOR2	■ ■

Press the key TEST 2 time for showing the second test menu

When the sign ■ is shown in the display, it means that this function is on.

Standard menu:

SPEED	30.0 M/h
TIME	00:00
DISTANCE	000
PRE. 00	POST 00

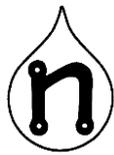
The first line shows the speed, it can be changed at any time during the irrigation.

The second line shows the time to the irrigation is finished incl. pre- and post-irrigation. The time can be read at any time during the irrigation.

The third line shows the remaining length of the pipe.

The fourth line shows the pre- and post-irrigation time, if the figures flashes it means that the pre- or post-irrigation counts down.

If the display shows LOW BAT instead of Speed, the battery voltage is lower than 11.8 V and the battery need to be charged.



TEST 1 menu:

TEST 1	
A. SPEED	030 m/h
BAT. VOLT .	12.3 V
CHARGE	ON

The second line shows the actual speed, that means the speed the machine is running now. This can be used to check the maximum running speed for the machine, if the Constant Rain is set to a much higher speed than the machine can run.

The actual speed can differ from the set speed, especially in the start, this is not an error because the Constant Rain ensures that the mean speed over 10 m is correct.

The third line shows the battery voltage.

The fourth line shows if the battery is charged from the solar panel.

The battery is charged when the voltage is below 14.0 volt.

TEST 2 menu:

TEST 2	PRESS	■	
STOP SENSOR		■	
SPEED SENSOR	■	■	
MOTOR1	■	MOTOR2	■

The first line shows if the pressure is high, the marker is on when the water pressure is high. The machine can only work when the pressure is high.

The second line shows if the stop switch is activated, the marker is on when the stop switch is on. The machine can only work when the stop switch is on. The stop switch has 3 functions:

1: Resets the distance counter.

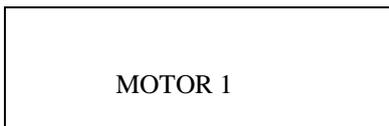
2: Post-irrigation.

3: Inhibits the pulses to the regulator-motor when the sensor is not activated of the magnet.

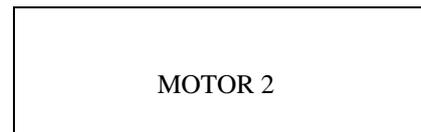
The third line is for testing the speed sensor, the markers is on when the magnets activates the speed sensors.

The fourth line shows if the motors have stopped, because they have reached their mechanical stops. If the marker is on and the motor has not reached their end position, there is a blocking inside the valve. The motor is stopped and the marker is set on, when the current exceeds 4.7 A.

DIFFERENT READOUTS:



When the display shows a flashing Motor 1, it means that the regulator motor is running, while the motor is running no keys can be activated. The motor runs for max. 26seconds.



When the display shows a flashing Motor 2, it means that the motor for stopping is running, while the motor is running no keys can be activated. The motor runs for max. 26 seconds.



If the STOP key is pressed while the magnet is not at the stop sensor, the display shows POWER OFF for 2 seconds and the electronic is at standby.

If the key PROG/POWER ON is pressed or if the pipe is pulled out, the power is turned on.

The battery is only charged when the power is on.



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START:

The turbine can only start if the magnet activates the stop sensor (or stop sensors). See test 2 for controlling the stop sensor. When the start key is pressed, the main valve opens Next the bypass valve closes (the turbine starts).

If the stop sensor is not activated by the magnet, it is only the main valve that opens. This is used if the pressure should be released before disconnecting the hose at the hydrant.

STOP:

When the magnet is removed from the stop sensor, the turbine stops and the main valve closes (opens at low pressure stop). If post-irrigation is chosen, the turbine stops and after the post-irrigation time, the main valve closes.

If the key " STOP " is pressed the turbine stops and the main valve closes, regardless of post-irrigation.

SUPERVISION:

The Constant Rain has a built in system for supervision. The supervision starts to work, if for some reason the machine irrigates at the same place longer than a specified time. This time is factory adjusted to 20 minutes. (See programming for changing this time).

If it is set to 0 there is no supervision.

Supervision of correct speed.

If machine data no.17 is set to 1, the supervision will also stop the machine if it is not running at the chosen speed, if there is more than 40 % error. If it is set to 0 there is no supervision of speed.

That possibility is not recommended. If the machine is stopped for one time in the future of this reason nobody can remember or understand the reason.

SPEED:

The speed is adjusted with the arrow keys, the speed first changes by steps of 0.1 m/h, then after 10 steps it changes by 1.0 m/h. The speed can be changed at any time, even whilst the machine is running. If the time is checked it shows the new time for the remaining irrigation.

The speed cannot be changed whilst any of the motors are running.

It is shown in the display as: MOTOR 1 or MOTOR 2.

PRE-IRRIGATION:

Pre-irrigation can be activated by pressing the key " PRE-IRRIGATION ".

The time for pre-irrigation is calculated by the Constant Rain as 8 x the time for running 1 metre at the actual speed. The constant " 8 " (constant no. 1) can be changed, see programming.

If the pre-irrigation is on, the machine starts and run 1/2 metre, then it stops for the pre-irrigation time.

By pressing the key " START/RESET " the pre-irrigation is cancelled.

The magnet at the stop sensor should be in place, before activating the pre-irrigation.

POST-IRRIGATION:

Post-irrigation can be activated by pressing the key " POST-IRRIGATION ".

The time for post-irrigation is calculated by the Constant Rain as 8 x the time for running 1 metre at the actual speed.

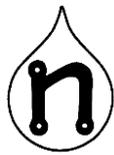
The constant " 8 " (constant no. 2) can be changed, see programming.

The post-irrigation starts to count down when the magnet is removed from the stop sensor.

When the magnet is removed, the motor for speed regulation stops the turbine, after the post-irrigation time the main valve closes, (opens at machines with stop for low pressure). At machines with only one motor for speed regulation, the turbine starts after the post-irrigation time and run to the mechanic stop.

By pressing the key " START/RESET " the post-irrigation is cancelled.

The magnet at the stop sensor should be in place, before activating the post-irrigation.



Solar panel:

On the display menu 2 is shown if the solar panel is charging

Be attending on that by pressing power off the charging is interrupt.

There are different constants that can be set by the user.

These constants will be saved for years even if the battery is disconnected.

Programming procedure:

The speed should be adjusted to 11.1 m/h (or to 11 f/h) to reach the constants.

Press rapidly the " PROGRAM " key 3 times to gain access to change the constants.

By subsequently pressing on the " PROGRAM " key the constant no. will step forward.

With the arrow keys the constant value can be changed. The Constant Rain goes back to normal and saves the constant by pressing the key " TEST ".

If the key " TEST " is not pressed the Constant Rain switches back to normal after 1 minute, and the changes of the constants are not saved.

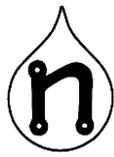
CONSTANTS

Const No.	Note	Fact. Adj.	Min. Value	Max. Value	Description
1		8	1	15	Pre-irrigation
2		8	1	15	Post irrigation
3		20	0	99	Supervision time
4		2	1	7	1 English, 2 Danish, 3 German, 4 French 5 Dutch, 6 Swedish, 7 Spanish
5		0	0	2	0 = Stop for high pressure, Slow shut-down 1 = Stop for low pressure, 1 long pulse and motor 2 runs in the opposite direction also set machine data 12 = 2 2 = motor 2 stopping is disconnected
6		0	0	15	Distance to post-irrigation
7		-	0	1000	Distance (if the distance has been reset)
8		0	0	1000	Reserve
9		100	-	-	Code to reach machine data

The constant no. 9 (the code) should be 111 to reach the machine data.

Then press " TEST " and the machine data is shown.

See next pages.



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MACHINE DATA

M.Data no.	Note	Fact. Adj	Min. Value	Max. Value	Description
0		400	0	1000	Pipe length m
1		110	40	200	Pipe diameter mm
2		1850	500	3000	Reel drum diameter mm
3		12.00	5.00	30.00	Windings pr. layer
4		200	50	1000	Large drive sprocket no. of teeth
5		10	5	40	Small drive sprocket no. of teeth
6		4	1	20	Number of magnets
7		0.89	0.70	1.00	Ovality
8		3	0	45	First pulse to main valve sec
9		160	0	300	Short pulses to main valve msec
10		2	1	5	Time between short pulses sec
11		100	0	250	Number of short pulses
12		1	0	2	Shut-down system, 0 = Only regulator motor 1 = 2 Motors, inlet valve closes at low press 2 = 2 Motors, inlet valve opens at low press 3 = 2 Motors, the same as when 1, but there is a delay of 8 sec. after the stopsensor is activated. before the speed regulator stops the turbine. 4 = 2 Motors, the same as when 2, but there is a delay of. 8sec. before the speed regulator stops the turbine, after the stopsensor is activated
13		26.1	0.9	26.1	Closing pulse length to the regulator motor
14		0	0	2	0 = No pressure switch mounted 1 = Pressure switch mounted (start / stop) 1 = Start and stop by radio transmitter 2 = Pressure switch mounted (only start)
15		0	0	160	Distance between pulses mm 62.5 = Running with a roller Ø 80 mm 0.0 = Running by the formula
16		0	0	1	Opening of the main valve 0 = Fast opening. 1 = Slow opening
17		0	0	1	Supervision of the right speed off. 0 = Supervision 1 = Supervision on
18		0	0	1	Meter or foot readings in the display 0 = meter. 1 = foot



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The Constant Rain can be adjusted to 2 different types of sensors.

One is a round sensor 60 mm in diameter and 4 sensors inside. This is only for rollers with one magnet. If this is used the 3 jumpers near the display on the printed circuit should be placed in a row at the round symbol.

When the battery is connected the display shows " VERSION 4.50 ".

The other is a square sensor, or 2 separate sensors, this is used for rollers with more than one magnet and for disk with 1 to 20 magnets.

If this is used the 3 jumpers near the display on the printed circuit should be placed in a row at the 2 line symbol.

When the battery is connected the display shows " VERSION 4.51 ".

Cable connection

Constant Rain 7. Cable connection			Version 4.51	Double sensor	Constant Rain 7 Cable connection			Version 4.50	Round sensor
1	+ Battery		Brown	12 V	1	+ Battery		Brown	12 V
2	- Battery		Blue		2	- Battery		Blue	
3	+ Solar Panel		Brown		3	+ Solar Panel		Brown	
4	- Solar Panel		Blue		4	- Solar Panel		Blue	
5	Motor 1			Speed Regulation	5	Motor 1			Speed Regulation
6	Motor 1			Speed Regulation	6	Motor 1			Speed Regulation
7	Speed Sensor 1		Blue		7	Speed Sensor 1		Blue	
8	Speed Sensor 1		Black		8	Speed Sensor 1		Black	
9	Speed Sensor 2		Yellow/green		9	Speed Sensor 2		Yellow/green (Red)	
10	Speed Sensor 2		Brown		10	Speed Sensor 2		Brown	
11	Stop Sensor		Blue or Brown		11	Stop Sensor		Blue or Brown	
12	Stop Sensor		Blue or Brown		12	Stop Sensor		Blue or Brown	
13	Motor 2			Stop Motor	13	Motor 2			Stop Motor
14	Motor 2			Stop Motor	14	Motor 2			Stop Motor
15	Pressure		Blue or Brown		15	Pressure		Blue or Brown	
16	Pressure		Blue or Brown		16	Pressure		Blue or Brown	
17	Not used				17	Not used			
18	Not used				18	Not used			
If the distance counter count the wrong way, The speed sensor should be turned.					If the distance counter count the wrong way, the cable on terminal 8 and 9 must be interchange.				



Fault localisation.

? The turbine cannot start by pressing START. Pre-and post-irrigation cannot take place.

Answer:

Magnet for stop-sensor is not on its place, or cable or sensor is damaged.

Stop sensor: The mark ■ must be on when the magnet is on place, and it disappears when the magnet is removed. See menu 3.

A damaged cable can be repaired but absolutely watertight. At least encapsulated in epoxy.

But a new sensor and cable is recommended.

If pressure sensor is used there must be pressure on the water. The mark ■ for pressure must be on.

? None figure in the display.

Answer:

Battery interrupts. Fuse inside the box is blown. The fuse is for wrong connection of + and - .

From the factory there is an extra fuse on a single fuse-holder on the printed circuit.

Fuse 5 A. Battery electric voltages 12 V. See menu 2.

? Distance meter is not correct and the speeds not correct.

Answer:

See after damaged cable or sensor. The 2 marks ■■ must during pulling out the tube appear in order from the left as following: The first appear the second appear the first disappear the second disappear. During retraction it must go in opposite order. See menu 3 speed sensor.

It is the same if a roller running on the tube measures the speed.

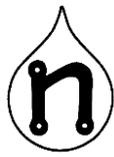
? Only maybe the half or 2/3 of the real length is counted up.

Answer:

The stop mechanism can be activated a short time by hopping of the tube or if the windings around the drum are lose. It can cause the magnet removed from the stop sensor a short moment. It will set the counter to zero.

In spite of the meter of the tube is not correct the irrigator will run to the end and stop normal. But incorrect speed depends of the incorrect registration of the actual layer.

If wanted the correct number of metre can be set in. See CONSTANT no 7.



The most used combination of different constants:

With constants factory adjusted the machine always will run. But there are different conditions from farm to farm and there are also different wishes from the farmer. Therefore some constants can be adjusted for local wishes.

1. Slowly start of turbine.

Machine data no. 13. Adjust the value to 4 sec to start.

Now the valve for control of speed will close about half and continue stepwise until the adjusted speed are reached. Correct adjustment is: Continuously closing of the valve until the turbine is start running and stepwise until adjusted speed is reached.

2. Slowly opening for inlet of water.

Machine data no. 16. Set the value to 1. = Opening for the water stepwise.

3. Only 1 motor for speed regulation.

Machine data no. 12. Value 0.

Post irrigation must take place as following: When the stop sensor is activated only the retraction stops. After the time for post irrigation the machine starts again and run to the mechanic stop.

4. Start-up of no. 2 machine when no. 1 machine reaches the stop.

Machine data no. 14. Value 2.

The machine must be equipped with adjustable pressure switch. Adjust the pressure switch to a point between the normal pressure and the pressure when the pump will stop.

For instance: Normal pressure 7 bar and pressure for pump stop is 9 bars. Adjust the pressure switch to 8 bar on both the machines. Start no. 1 machine as normal by pressing start. Set up no. 2 machine but press stop. When no. 1 machine comes to slowly close down no. 2 machine will start up when the pressure reach 8 bars. Be attend on that 10 m different on the field level is 1 bar.

5. Only if pressure switch is mounted.

The valve for inlet of water remains open when pressing start, can be wanted to make pulling out easier.

Machine data no. 12. Value 2. = Valve for inlet of water remains open with low pressure.

But be attend on the pipe will be empty if the gun is lower than the pump.

Alternatively set the value factory adjusted = 1. And prevent the magnet to reach the stop sensor.

When pressing start the valve will remain open.

After pulling out remember that the magnet must be free to reach the stop sensor before pressing start.

The machine cannot start if the magnet is not at place.

6. Stop with low pressure and pressure switch mounted. Constant no. 5. Value 1.

Machine data no. 12 must be value 2. = Stop motor turns in opposite direction.

It means that with the same cable connection to the motor the valve will open for stop. After 2 minute the valve close again

Stop-sensor, stop-button and supervision can open the valve. But the pressure switch cannot open the valve

7. Pre-irrigation before the gun reaches the stop. Constant no 6 can be set to the number of metre where it is wanted that the post irrigation should take place. Max 15 metre.