

DIRECTION FOR USE
PROGRAM RAIN 9
VERSION 19 DATE 20-09-98

PR9.V19.EN

KEYBOARD:

MENU MENü

KEY TO GET access TO THE DIFFERENT MENU IN THE DISPLAY

- Speed
- Total irrigation time
 - Length of the pipe
 - Pressure sensor
 - Stop sensor
 - Pre- and post-irrigation
 - Timer, time to start
 - Speed sensor
 - Motor 1, regulation motor
 - Motor 2, stop motor
 - Battery voltage
 - Charger on/off
 - Actual speed
 - Elapsed time and elapsed distance

START:

The turbine can only start if the magnet activates the stop sensor (or stop sensors), see menu 3 for controlling the stop sensor. When the start key is pressed, the bypass valve closes (the turbine starts), and then the main valve opens. 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 PROGRAM 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. 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.

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 shown in the display for 2 seconds. The time for pre-irrigation is calculated by the PROGRAM RAIN as 8 x the time for running 1 meter at the actual speed. The constant " 8 " 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. The marker at PRE-IRRIGATION is flashing when the pre-irrigation counts down. (see menu 3) By pressing the key " START/RESET " the pre-irrigation is cancelled. The magnet at the stop sensor should be in place, before activating the the pre-irrigation.

POST-IRRIGATION:

Post-irrigation can be activated by pressing the key " POST-IRRIGATION " The time for post-irrigation is shown in the display for 2 seconds. The time for post-irrigation is calculated by the PROGRAM RAIN as 8 x the time for running 1 metre at the actual speed. The constant " 8 " can be changed, see programming. The post-irrigation starts to count down when the magnet is removed from the stop sensor. The marker at post-irrigation is flashing when the post-irrigation counts down. (see menu 3) 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. 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.

DISPLAY

By pressing the MENU key the different menu's can be shown in the display. After 1 min. the display automatic shows menu 1.

SPEED 30.0m/h
TIME 00h 00min

MENU 1.

SPEED 30.0m/h
DISTANCE 000m

PRESS THE KEY
SHOWING MENU 2.

MENU
MENü

ONCE FOR

PRESS STOPSW
PRE-IR POST-IR

PRESS THE KEY
SHOWING MENU 3.

MENU
MENü

2 TIMES FOR

TIMER SPEED
MOTOR1 MOTOR2

PRESS THE KEY
SHOWING MENU 4.

MENU
MENü

3 TIMES FOR

BAT.VOLT. 12.3V
CHARGE ON

PRESS THE KEY
SHOWING MENU 5.

MENU
MENü

4 TIMES FOR

A.SPEED 030m/h
00000h 00000km

PRESS THE KEY
SHOWING MENU 6.

MENU
MENü

5 TIMES FOR

SPEED 30.0m/h
TIME 00h 00min

PRESS THE KEY
SHOWING MENU 1.

MENU
MENü

6 TIMES FOR

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

DESCRIPTION OF THE DIFFERENT MENU'S

MENU 1

3SPEED	30.0m/h
TIME	00h 00min

STANDARD MENU

The display shows the speed and the time to the irrigation is finished incl. pre- and post-irrigation. The number in front of SPEED (here 3) means that it irrigates in zones, and the shown speed is the actual speed in the zone. If there is no number in front of SPEED it irrigates with constant speed during the whole irrigation. If you have chosen another menu it will always go back to menu 1 after 1 minute. If the display shows LOW BAT in stead of SPEED, the battery voltage is under 11.8 V and the battery needs to be charged.

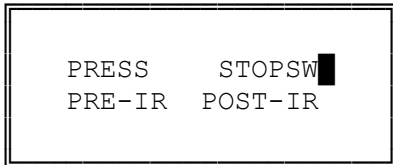
MENU 2

SPEED	30.0m/h
DISTANCE	000m

This shows the speed and the length of the pipe. If you want to irrigate in zones, the distance to the different zones can be read when the pipe is pulled out.



When the marker at PRESS is on, it means that the water pressure is high. The machine can only work when the pressure is high. If machine data no. 14 is set to 0, the PROGRAM RAIN works as if the pressure always is high. If there is mounted a pressure sensor, machine data no. 14 should be 1.



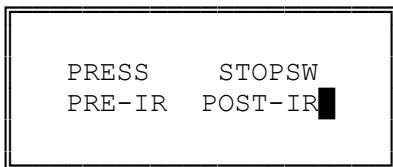
When the marker at STOPSW is, on it means that the magnet at the stop switch is at the sensor, and the machine is ready for start.

The stop switch has 3 functions:

- 1: Resets the distance counter.
- 2: Post-irrigation.
- 3: Inhibits the pulses to the regulator motor



When the marker at PRE-IR is on, it means that pre-irrigation is chosen. If the marker is flashing, the time to start counts down.



When the marker at POST-IR is on, it means that post-irrigation is chosen. If the marker is flashing, the time to stop counts down.

MENU 4

```
TIMER █    SPEED
MOTOR1    MOTOR2
```

When the marker at TIMER is on, it means that the time to start (opening of the main valve) is counting down. See programming for setting the timer.

```
TIMER    SPEED █ █
MOTOR1    MOTOR2
```

The 2 markers at SPEED is on when the magnet is activating the speed sensors.

```
TIMER    SPEED
MOTOR1 █  MOTOR2
```

When the marker at MOTOR1 is on, it means that the motor for speed control have reached it's mechanical stop. If the marker is on, and the motor is not at the end position there is a blocking inside the valve. The motor is stopped and the marker is set on, when the curent exceeds 4.7 A

```
TIMER    SPEED
MOTOR1    MOTOR2 █
```

When the marker at MOTOR2 is on, it means that the motor for the main valve have reached it's mechanical stop. If the marker is on, and the motor is not at the end position there is a blocking inside the valve. The motor is stopped and the marker is set on, when the curent exceeds 4.7 A

MENU 5

```
BAT.VOLT. 12.3V
CHARGE     ON
```

This shows the battery voltage. If the voltage drops below 11.8 volt, it is indicated in the display by LOW BAT instead of SPEED at menu 1. If the charge is on, the battery is charged from the solar panel. The battery is charged when the voltage is below 14.0 volt.

```
A.SPEED  030m/h
00000h   00000km
```

This 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 Program 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 Program Rain ensure that the mean speed over 10 m is correct. The lower line show how many hours the machine has been used, and how many kilometres the machine has run.

DIFFERENT READOUTS

```
MOTOR 1
MOTOR 1
```

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. 26 seconds.

```
MOTOR 2
MOTOR 2
```

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

```
POWER OFF
POWER OFF
```

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.

```
BIP BIP BIP BIP
BIP BIP BIP BIP
```

When the display show BIP a signal is send to a radio transmitter or a lamp for 12 seconds. This signal is send when: the pipe is pulled out to the distance as set in the constant no. 8, or the machine is stopped because of, low pressure, or stop sensor activated, or supervision time ran out.

There are different constants that can be set by the user. These constant will be saved for years even if the battery is disconnected.

Programming procedure:

The speed should be adjusted to 11.1 m/h to reach the constants. The display will show " P.CONST " instead of " SPEED " when the speed is adjusted to 11.1 m/h.

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 PROGRAM RAIN goes back to normal and saves the constant by pressing the key " MENU ".

If the key " MENU " is not pressed the Program Rain switches back to normal and the changes of the constants are not saved.

The constants are saved, even if the battery is disconnected for a longer period.

CONSTANTS

CONST no.	FACT. ADJ	MIN. VALUE	MAX. VALUE	DESCRIPTION
0	-	0	65h00	TIMER (TIME TO START)
1	8	1	15	PRE-IRRIGATION
2	8	1	15	POST-IRRIGATION
3	20	0	99	SUPERVISION TIME min
4	2	1	7	1 ENGLISH, 2 DANISH, 3 GERMAN, 4 FRENCH 5 DUTCH, 6 SWEDISH, 7 FINNISH
5	0	0	1	0 = STOP FOR HIGH PRESSURE, SLOW SHUTDOWN 1 = STOP FOR LOW PRESSURE, 1 LONG PULSE AND THE MOTOR RUNS IN THE OPPOSITE DIRECTION ALSO SET MACHINE DATA 12 = 2 2 = THE MOTOR FOR STOPPING IS DISCONNECTED
6	0	0	15	DISTANCE TO POST-IRRIGATION m
7	-	0	1000	DISTANCE (ONLY FOR TEST) m
8	0	0	1000	DISTANCE FOR BIPPER (0 = NO BIP)
9	100	-	-	CODE TO REACH MACHINE DATA

The constant no. 9 (the code) should be 111 to reach the machine data. Then press " PROG " and the machine data is shown.

MACHINE DATA

CONST no.	FACT. ADJ	MIN. VALUE	MAX. VALUE	DESCRIPTION
0	400	0	1000	PIPE LENGHT 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
5	10	5	40	SMALL DRIVE SPROCKET
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	SHUTDOWN SYSTEM, 0 = 1 MOTOR 1 = 2 MOTORS, INLET VALVE CLOSES AT LOW PRESS 2 = 2 MOTORS, INLET VALVE OPENS AT LOW PRESS
13	26.1	0.9	26.1	OPENING PULSE LENGHT TO THE REGULATOR MOTOR
14	0	0	2	0 = NO PRESSURE SWITCH MOUNTED 1 = PRESSURE SWITCH MOUNTED 2 = RADIO START
15	0	0	160.0	DISTANCE BETWEEN PULSES 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	100	-	-	CODE TO REACH THE TEST DATA

The constant no. 18 (the code) should be 111 to reach the test data. Then press " PROG " and the test data is shown. The test data can not be changed by the arrow keys.

TEST DATA

1	-	-	-	ACTUAL LAYER NO.(OUTER = 1)
2	-	-	-	ACTUAL DISTANCE BETWEEN PULSES
3	-	-	-	ACTUAL TOTAL NUMBER OF PULSES
4	-	-	-	MEASURED TIME BETWEEN PULSES
5	-	-	-	PULSES PER REEL DRUM REVOLUTION
6	-	-	-	PULSES PER LAYER
7	-	-	-	REEL DRUM CIRCUMFERENCE
8	-	-	-	INCREASE OF CIRCUMFERENCE PER LAYER
9	-	-	-	TOTAL NUMBER OF LAYER
10	-	-	-	NUMBER OF PULSES IN OUTER LAYER

For proper operation it is necessary, that the distance between the pulses is between certain limits.

MIN. PULS DISTANCE 40.0 mm for the layer with the small diameter.
 MAX. PULS DISTANCE 160.0 mm for the layer with the large diameter.

PROGRAMMING OF 5 DIFFERENT SPEEDS:

The speed must not be 11.1 m/h as this is the speed to get access to change the machine constants.

The pipe should be pulled out before programming, so the computer knows the distance of the field to be irrigated.

In the following it is assumed that the field length is 400 m.

Press the " PROG " key 3 times and the display will show:

```
ZONE 1 400m 300m
SPEED  30.0m/h
```

The distance to the right in the first line will have a flashing " m ". This value can be changed with the arrow keys. Here it is set to 300 m.

When the desired distance is set, press again the " PROG " key once, now the " m/h " in line 2 after the speed value will be flashing, which indicates that the speed can be changed. Here the speed is set to 25 m/h. The display will show:

```
ZONE 1 400m 300m
SPEED  25.0m/h
```

The machine will now irrigate at a speed of 25.0 m/h from 400m to 300m. Press the key " PROG " once more and the display will show:

```
ZONE 2 300m 300m
SPEED  30.0m/h
```

Zone 2 can now be programmed in the same way as zone 1. This is repeated for all 5 zones. Zone 5 automatic ends at 000m. When zone 5 is programmed press again the " PROG " key and the display will show:

```
DEL.  PRESS MENU
SAVE  PRESS PROG
```

If " PROG " is pressed the program is saved and the watering is carried out according to the program. If " MENU " is pressed the program is deleted and the speed is the same for the whole field, the function is the same as for CONSTANT RAIN 6. When the program is used it is deleted. After the program is saved you can check the program by pressing " PROG " 3 times. If you only use the " PROG " key and don't touch the arrow keys the program will only be displayed and not changed.

The program 9 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 19.10 ".

The other is a square sensor, or 2 separate sensors, this is used for rollers with more than one magnet and for disk's with 1 to 25 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 19.11 ".

1	+ BATTERY	12 V
2	- BATTERY	- SOLAR PANEL
3	MOTOR	SPEED REGULATOR
4	MOTOR	SPEED REGULATOR
5	+	+ SOLAR PANEL
6	SPEED1	SPEED SENSOR 1
7	SPEED2	SPEED SENSOR 1
8	SPEED3	SPEED SENSOR 2
9	SPEED4	SPEED SENSOR 2
10	STOP	STOP SENSOR
11	STOP	STOP SENSOR
12	MOTOR	STOP MOTOR
13	MOTOR	STOP MOTOR
14	BIPPER -	
15	BIPPER +	
16	PRESSURE	PRESSURE SENSOR
17	PRESSURE	PRESSURE SENSOR

IF THE DISTANCE COUNTER COUNT THE
WRONG WAY, THE SPEED SENSORS
SHOULD BE INTERCHANGED.