CF4 SERIES

Manual



CF4 SERIES - Features

The NOVVO CF4 series controller is a filter washing controller from 1 to 4 stations for agricultural applications. It is powered by an external 9V alkaline battery and has 12V outputs for the control of latch solenoid valves by pulses.

The unit is equipped with a microcontroller, analog differential pressure sensor and switches for setting the desired parameters. The unit can optionally handle a pressure-sustaining valve. The dimensions of the unit are 160 x 125 x 80 mm. The electronic system has a waterproof enclosure with protection IP65 / DIN EN 60529, made of ABS.

The wash cycles can be triggered either by time or by pressure difference (DP) when the set threshold is reached:

- By "time": acting when the water has circulated through the filters a time determined by the internal clock.

- "Pressure drop": acting whenever the controller receives the signal from a differential pressure switch that controls the pressure drop between the input and the output of the filters, as a result of the dirt accumulated in them.

- By combining the "pressure drop" with the "elapsed time", thus ensuring a minimum periodic cleaning, if not previously required by unexpected accumulation of dirt.

- The unit can optionally operate a Pressure Holding Valve.

- Endless wash problems are detected when there are more than ten consecutive wash cycles. If this value is exceeded, the controller will stop washing and emit an alarm signal.

- You can start washing manually.

Inputs and Outputs

The apparatus has the following inputs:

- Two inputs to detect the pressure drop in the filters (necessary for "pressure drop" starts), one to measure the upstream (BLUE tube) pressure and another downstream of the filters (BLACK tube).

- It has a manual wash button. Optionally an external pressure switch with dry contact output can be connected to this input.

- Four 12 Vdc outputs for latch solenoid valves (two-wire) with low consumption. If desired, the first of the outlets (VS) can be connected to a holding valve

Models and options

Version for 1 to 4 filters with wash and rinse, or for up to three filters and a pressure-maintaining valve. The wash duration and the time between washings of the group of filters are adjusted from the controller. Filters are washed sequentially.

How to Program the Controller

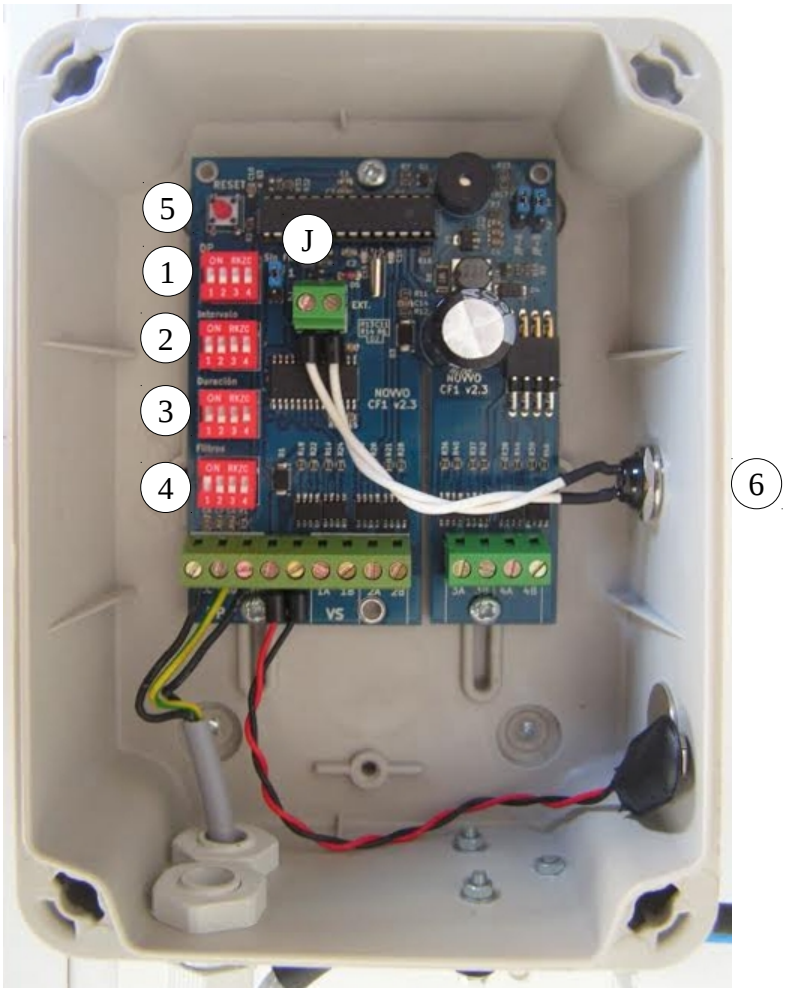
All parameter values and timings of the controller are very easy to program by the user. The controller has groups of four switches each. Within the group each of the switches can be in position "1" (up) or "0" (below) (see table). The first group (1 in the figure) of switches allows setting the pressure differential thresold above which the wash cycle has to be triggered. If it is not desired to set this parameter, all switches in this group must be set to "0". The second group of switches (2) is used to determine the time between washings, indicating the position "0" of all of them when it is not desired to establish a time control. The positions of the switches of the third group (3) determine the duration of each washing and, finally, the positions of the fourth group (4) determine the number of filters and the existence or not of a holding valve.

The endless wash control is configured according to the jumper connection (J, Figure 1). If position 1 is occupied, the alarm is activated, being deactivated if position 2 is switched on.

To access the switches, unscrew the controller cover. On the back of the cover is the table with the different combinations of positions of the four groups of switches and their meaning.

If the positions of the switches are modified, the RESET button (5) must be pressed to make the new program effective.

Figure 1. Jumpers and switches for the configuration to be made by the user



Operation

Once detected the cleaning command, the controller will activate sequentially (one after another) the connected filters. The pause between the washing of each one of the filters can be regulated being its duration equal for all of them. This timing is important to recover pressures in the network and to avoid overlaps in the hydraulic valves.

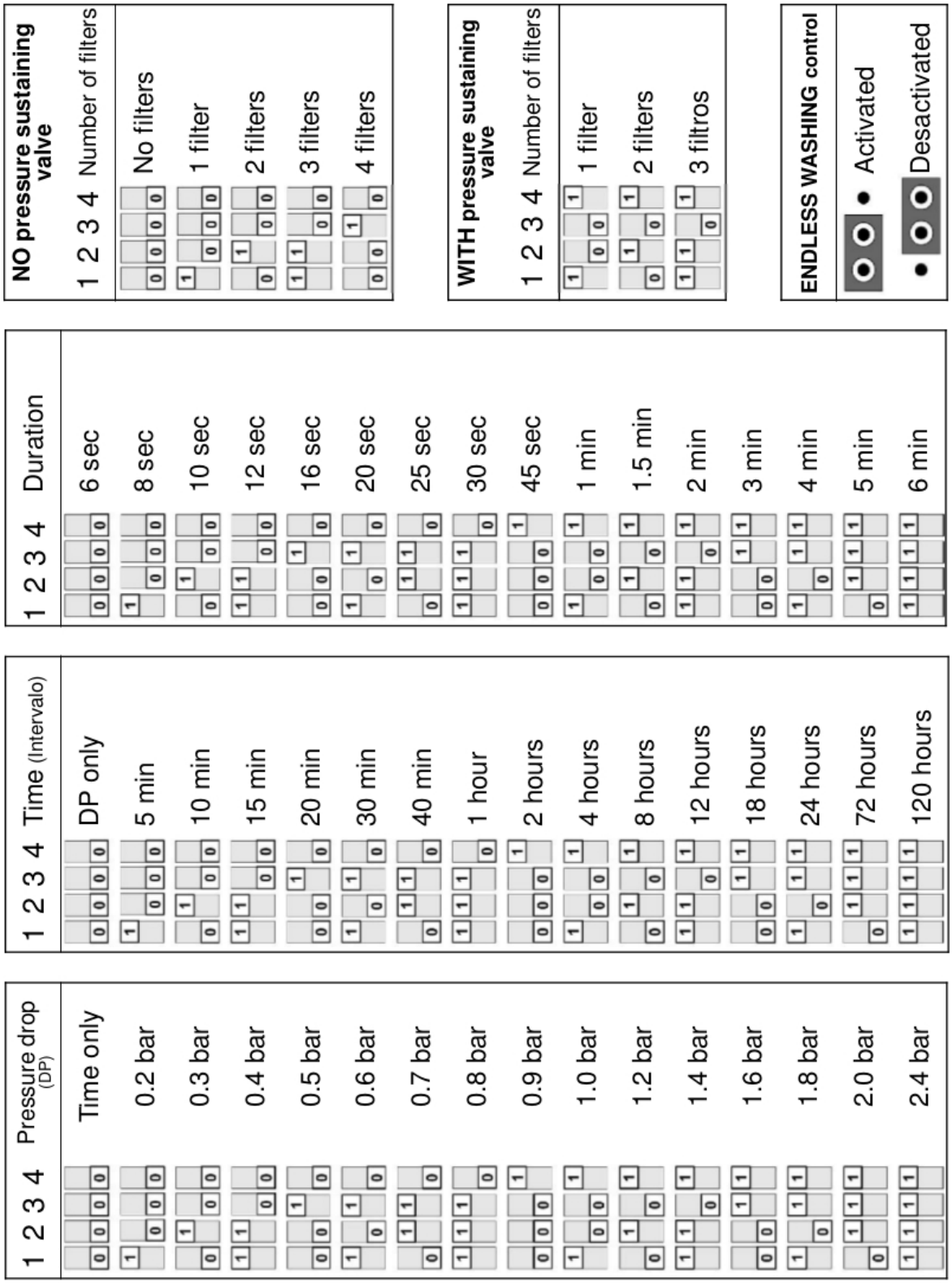
A cleaning sequence can be initiated manually by pressing the external button (6) for ten seconds. To manually interrupt the wash sequence, restart the apparatus by pressing the RESET button.

ALARM SOUND KEY

1 beep, normal;
2 beeps, endless washing detected;
3 beeps, low battery;
4 beeps, Pressure difference sensor (DP) not connected or faulty
NOTE: In some versions of the programmer, if the washings are programmed based on the pressure

difference, the washing stops if the DP sensor is not connected or is defective. If it is desired to continue washing in that circumstance the DP switches should be set to 0000 (only time) and reset by pressing the RESET button.

SWITCH POSITION KEY



ADDITIONAL OPTIONS. INSTRUCTIONS FOR THE INSTALLER

The CF4 automatic filter backflush controller allows you to adjust a number of parameters that are not normally included in those of other manufacturers. These parameters are:

- Pressure sensor delay. Minimum time the differential pressure must be maintained above the threshold for the washing to start.

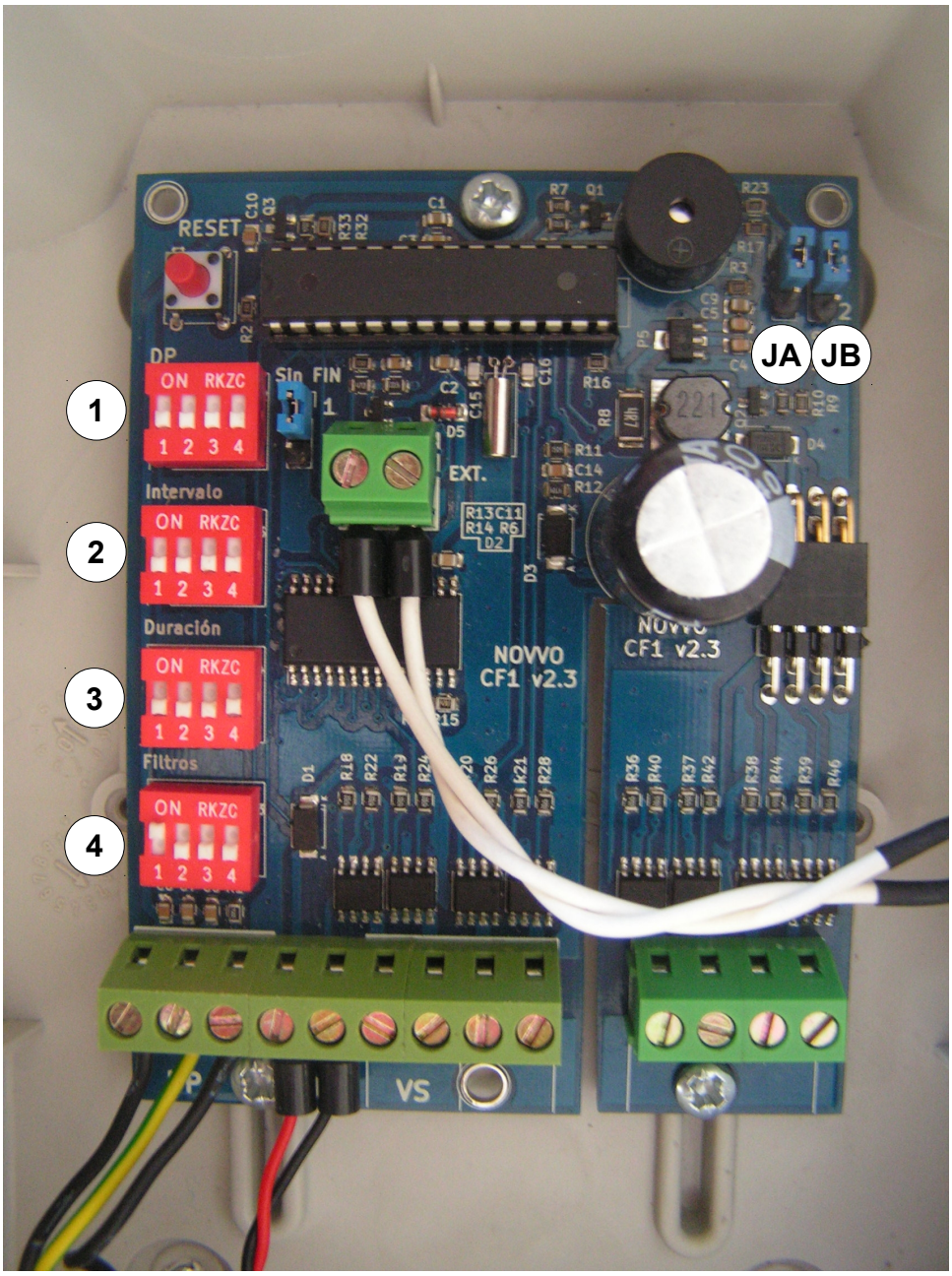
- Delay between filters. Delay time between the cleaning of each filter.

- Delay between the holding valve and the washing of the first filter.

- Post-wash delay. Minimum time that must elapse after a wash to start the next wash cycle.

It is also possible to tare the differential pressure sensor. This option is not normally required because the sensors are calibrated at the factory. It will be used only on extraordinary occasions of loss of calibration.

Figure 2. Jumpers and switches for configuration by authorized personnel



Advanced configuration

The controller has two jumpers named JP-A and JP-B. These connectors are used to carry out initial configurations by the installer or authorized personnel. The inactive status of both connectors is either the "1" position or the jumpers removed. Figure 2 shows the position of the jumpers and switches described below.

The configuration is carried out as follows:

1. Connect the controller battery

2. Place the JP-A and JP-B connectors in the desired positions

With JP-A in position "2" we can configure the following variables:

- "DP" switches (1 in the figure). Used to adjust pressure sensor delay.

- "Intervalo" switches (2). Used to set delay between filters.

- "Duracion" switches (3). It is used to adjust delay between the holding valve and the first filter.

- "Filtros" switches (4). Used to adjust post-wash delay.

3. Set the slide switches.

The following table specifies the values that are set depending on the arrangement of the switches with the JP-A connector in position 2 and the JP-B connector in position 1.

JP-A in position **2; JP-B** in position **1**				
Delay	**DP sensor**	**Entre filtros**	**Sostenedora**	**Post-lavado**
Interruptor	**DP**	**Intervalo**	**Duracion**	**Filtros**
1 2 3 4				
0 0 0 0	No modifications	No modifications	No modifications	No modifications
1 0 0 0	0 sec	0 sec	0 sec	0 sec
0 1 0 0	20 sec	05 sec	5 sec	20 sec
1 1 0 0	40 sec	10 sec	10 sec	40 sec
0 0 1 0	1 min	15 sec	15 sec	1 min
1 0 1 0	1 min 30 sec	20 sec	20 sec	1 min 30 sec
0 1 1 0	2 min	25 sec	25 sec	2 min
1 1 1 0	2 min 30 sec	30 sec	30 sec	2 min 30 sec
0 0 0 1	3 min	35 sec	45 sec	3 min
1 0 0 1	3 min 30 sec	40 sec	1 min	4 min
0 1 0 1	4 min	45 sec	1 min 30 sec	5 min
1 1 0 1	4 min 30 sec	50 sec	2 min	6 min
0 0 1 1	5 min	55 sec	3 min	8 min
1 0 1 1	5 min 30 sec	1 min	4 min	10 min
0 1 1 1	6 min	1 min 10 sec	5 min	15 min
1 1 1 1	7 min	1 min 20 sec	6 min	20 min

With the JP-B jumper in position 2, we can calibrate the pressure difference sensor by adjusting the positions of the DP switch (1) tabs as follows:

JP-A in position **1; JP-B** in position **2**	
1 2 3 4	**DP**
0 0 0 0	No modifications
1 0 0 0	Set calibration

If both the JP-A and the JP-B are placed in position 2 we return to the conditions set by the manufacturer, which are indicated below:

- Delay between holding valve and first filter wash: 20 sec.

- Washing delay between filters: 5 sec.

- Pressure difference sensor delay: 20 sec.

- Delay after a wash: 40 sec.

- Sensor type: standard pressure difference sensor.

NOTE: DELAYS add up, so the installer should take this into account when adjusting them.

4. Restart with the RESET button.

Upon restart you will hear the following sounds:

- If **JP-A** is in position **2** and **JP-B** in position **1**: two short beeps followed by a long one.
- If **JP-A** is in position **1** and **JP-B** in position **2**: three short beeps and one long beep. If the differential pressure sensor is calibrated, you will hear four short and one long beeps.
- If **JP-A** is in position **2** and **JP-B** in position **2**: a short beep followed by a long beep.

5. Replace the JP-A and JP-B connectors in the "1" position or remove them.

6. Adjust the sliding switches again, in this case to set the differential pressure threshold, the interval between washings, the duration of the washing, the number of filters and the presence or not of a holding valve, as indicated above in the MANUAL.

7. Restart again and the six characteristic start beeps will be heard.

At this point, the controller is ready for operation.

CONNECTIONS SCHEME

