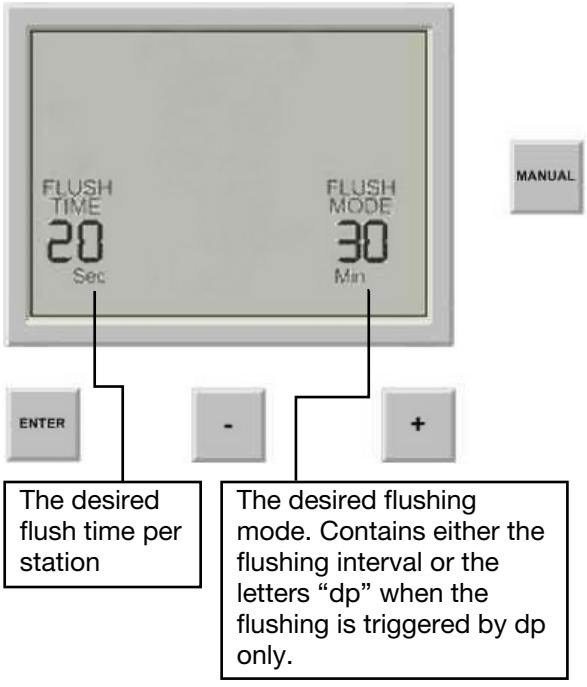
Filtron flush controller

General instructions:
The flush controller is made and designed to flush semi-automatic filters. After installation of the Filtron, it can flush the filter at a preset time, pressure difference or on manual activation. The flushing controller can, as an option, be modified for use with a pressure-maintenance/main valve and an alarm output.

Installation instructions:
Mount the flush controller in an easily accessible place. If the flush controller is exposed to more than occasional water splashes, it needs to be protected against this with a cover or casing.

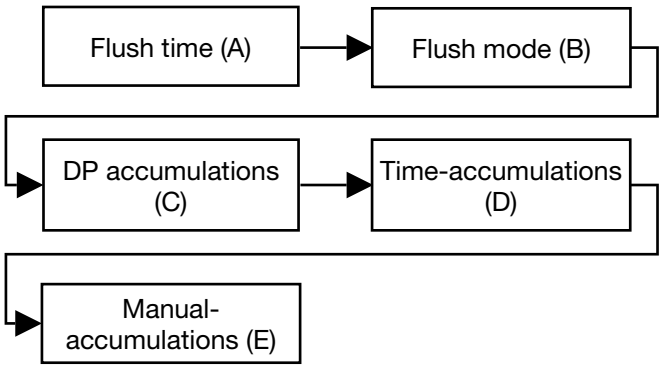
Programming the controller:
The controller is equipped with an LCD display and 4 keys as displayed below. When the unit is left untouched for a minute the display is switched off and the only life signal is given by a beep sound that can be heard every 20 seconds. Holding down any of the keys for a few seconds will bring the screen back to life.



The screen consists of several fields, some of them are editable and some of them are not. For inserting EDIT MODE the ENTER key has to be pushed. The EDIT MODE is indicated by blinking of the characters at the currently editable field. Each time the ENTER key is pushed again, the next editable field becomes under focus and starts blinking. While in EDIT MODE the “+” and “-“ keys can be used for changing the value under focus. Pushing the ENTER key again will set the selected value to the current field and move the focus to the next editable field which will start blinking. Once entering this process of passing through the editable fields, the user has no way back but by pushing the ENTER key repeatedly, he passes through the chain of editable fields until arriving back to the FLUSH TIME field, meeting no more blinking fields.

Notice: that before the first use of the unit, it may be necessary to pass through the configuration process prior to defining the flushing program in order to adjust the features of controller to the specific application. The configuration process is described below.

The series of editable fields:



(A) The flush time:
Defines the duration of the flushing time per station. The following options are selectable:

5-20 sec in steps of 1 sec
20-55 sec in steps of 5 sec
1-6 min in steps of 0.5 min

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The DP setting:
As standard, the Filtron is supplied with an external electronic pressure difference switch. The DP setting is determined on the external DP sensor, which is set as standard to 0.5 bar. The flush request signal is indicated in the form of a closed dry contact on the relevant input terminals.

The pressure difference of the external DP sensor may be set using the screw on the side. One whole turn of 360° adjusts the pressure difference by 0.1 bar.
Turn anticlockwise to reduce the switching pressure.
Turn clockwise to increase the switching pressure.

This DP setting is not visible on the Filtron with the external pressure difference switch provided as standard.

(B) The Flush Mode:
The Flush Mode determines how the flush cycle is activated. The selectable options are:

- **OFF** - no flushing will take place
- **By time** – In this case the flushing cycles will be repeated in a selected interval or will be triggered by the DP signal depending on what happens first. No matter how was the flushing cycle started the interval to the next cycle will start to be measured again after each ending of a flushing sequence. The selectable intervals are the following: 5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 55, 60 minutes 2, 3, 4, 5, 6, 8, 12, 18, 24, 72, 120 hours
- **dp** – flushing will be triggered by DP only.

Note: When the keys '+' and '-' are pressed at the same time, in the field 'Flush Mode' the remaining time until the next cycle is shown in alternating hours and minutes.

(C D E) Accumulations:
The unit independently accumulates and displays the number of flush cycles that are initiated by DP, on time or manually.
For each of the accumulation fields, the '+' or '-' keys can be used to clear the accumulated value.

The configuration process:
Start the configuration process by holding the ENTER key pressed in for at least 3 seconds. The unit detects how many plug-in boards (each with two outputs) are in use in the specific case.
How the outputs are assigned depends on the definitions that are set during the configuration process described below. The following rules apply:

1. Backflush valves will be allocated starting from output 1 and up.
2. The last backflush valve can be canceled and then its allocated output will be left unused.
3. Alarm output, Delay-Valve and Main-Valve when defined, will be allocated in this order, right after the last backflush valve (whether in use or not).

Example:
In the case of three plug-in boards, six outputs can be used. In the absence of an alarm output, a delay valve and a main valve, all the six outputs are assigned to back-flow valves.
If a main valve is defined, the first five outputs are assigned to back-flow valves and output no. 6 is assigned to the main valve. Output no. 5 (for the last back-flow valve) can be disabled and then remains unused. If a delay valve is also defined, this is assigned to output 5, immediately prior to the main valve. The first four outputs are then available for back-flow valves and of these output 4 (for the last back-flow valve) can be disabled. This output then remains unused. If an alarm output is also defined, this is assigned immediately prior to the delay valve. In this case only the first three outputs are available for back-flow valves. Output 3 can be disabled (disabling is possible in View Outputs using the manual key).

During the configuration process, the following functions are defined:

Main valve (pressure maintenance valve): Yes/No. If the answer is 'Yes', the Pre-Dwell delay between the main valve opening and the opening of station no. 1 can be defined. The selectable delay steps are: 5 - 10 - 15 - 20 - 25 - 30 - 35 - 40 - 45 - 50 - 55 seconds - 1 - 1.5 - 2 - 2.5 - 3 - 3.5 - 4 - 4.5 - 5 - 5.5 - 6 minutes

Dwell time: The delay between stations can be set to 5 - 10 - 15 - 20 - 25 - 30 - 35 - 40 - 45 - 50 - 55 or 60 seconds.

DP delay: The delay during which the DP sensor reading is expected to remain stable for a reaction can be set to 5 - 10 - 15 - 20 - 25 - 30 - 35 - 40 - 45 - 50 - 55 - 60 seconds.

Looping limit: The number of successive flush cycles activated by the DP sensor that can be conducted before it is established that an endless loop problem has arisen. The options are: 1-10 or 'no', which means that the loop problem is ignored.

Alarm: Yes/No. An output is assigned for alarm activation.

Delay Valve: Yes/No – an output is assigned to activation of the delay valve.

View Outputs: This is a special mode with which the list of outputs can be gone through to see how each output is assigned. Use the '+' key to change 'no' to 'yes' and confirm with ENTER. Then use the '+' key to step through the list. The ordinal number of the output is displayed in the bottom left corner. The function that is assigned to the output is displayed in capital letters in the middle of the screen. The possible number of outputs that can be used is always an even number, because it is calculated based on the number of plug-in boards used (each with two outputs). If the number of outputs needed is an odd number, however, the last valve that is assigned to flushing can be disabled using the manual key for manual operations.

Pressure units: The units that are used for pressure measurements. Choice of bar or psi. This is not applicable for an external pressure difference switch.

Calibration: Zero calibration of the built-in electronic DP sensor. Select 'Calibration = Yes' with the sensor ports disconnected (disconnect high and low pressure hoses for calibration).
This is not applicable for an external pressure difference switch.

Version display: The last screen of the configuration contains information about the controller's software version. The versions consist of four figures, such as:
00
13

Reset: When adding or removing a plug-in board, always switch off the power. This also resets the controller.

Solving endless loops:
As explained above, endless looping problem will be declared when the number of consecutive flushing cycles triggered by the DP sensor exceeds the "Looping limit" defined during configuration. The fact that endless looping problem was detected will be indicated on the display and will cause the activation of the Alarm output, additionally, the DP indication will no longer be considered as a trigger for flushing. The following flushing cycles will be triggered by the interval count down only.

The problem will be considered as solved when the constant indication of the DP sensor will be removed.

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Low pressure:
When a closed contact indication is received at the low pressure input of the controller, the symbol will start to appear blinking at the display. All activities will stop including the countdown to the next flushing cycle. If the low pressure happened while a flushing sequence was in progress, when the low pressure condition terminates the flushing sequence will start from the beginning rather than continue from the stop point.

Battery low (DC version):
The unit has two levels of low battery indication. At the first level when the battery voltage drops to the first level, the sign will start to appear at the screen. When the battery voltage drops further and reaches the second level, all outputs will shut down, the screen will be cleared leaving only the low battery icon.

Manual activation:
A flushing sequence can be manually activated by the “MANUAL” key. When manually activated the icon will appear on the display. The same key will be used for manually terminating a sequence in progress.

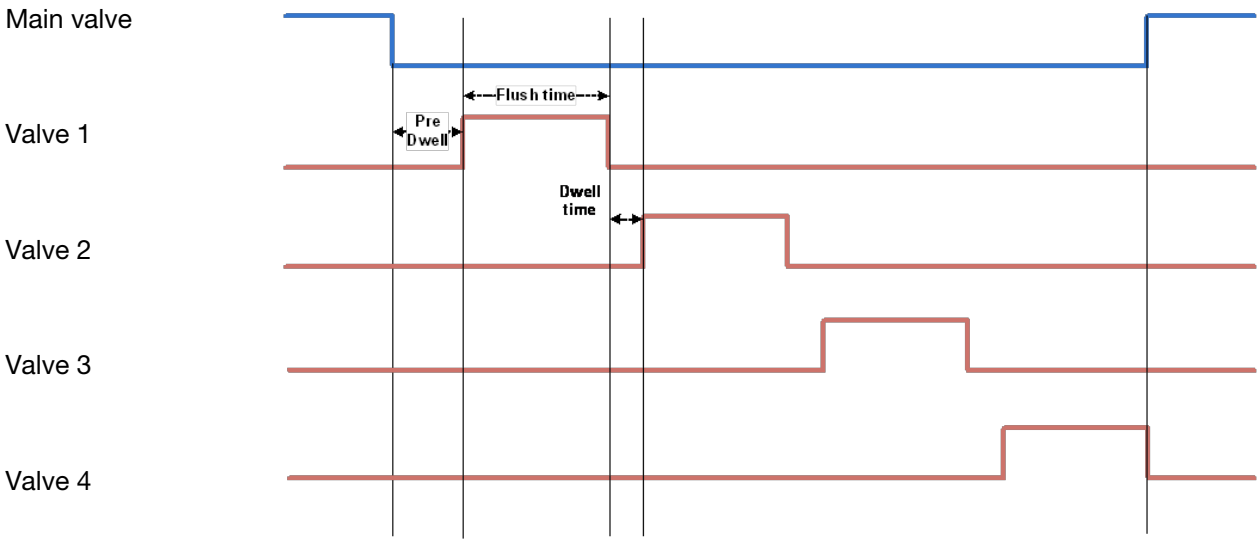
Adding and removing of plug-in units:
The number of connections on the Filtron may be altered with plug-in units. Before the configuration is altered, the power must be removed from the unit.
The addition and removal of the plug-in units happens by sliding the bottom dark grey cover downwards. Ensure that the plug-in units are all in the left-hand connectors, so when adding units, work from left to right.
Slide the plug-in unit carefully part way into the connector until the plastic bracket at the bottom fits into the hole and then slide the unit fully home.
Removal happens in the reverse order.

Technical data:
AC model:
Power supply: 220 or 110 V AC 50 or 60 Hz with built-in transformer to 24 V AC.
Outputs: 24 V AC solenoids.
DP sensor:
Standard: external dry contact DP sensor.
Option: built-in electronic analogue DP sensor.
Pressure sensor: dry contact pressure sensor (option)
Ambient temperature: 0-60°C.

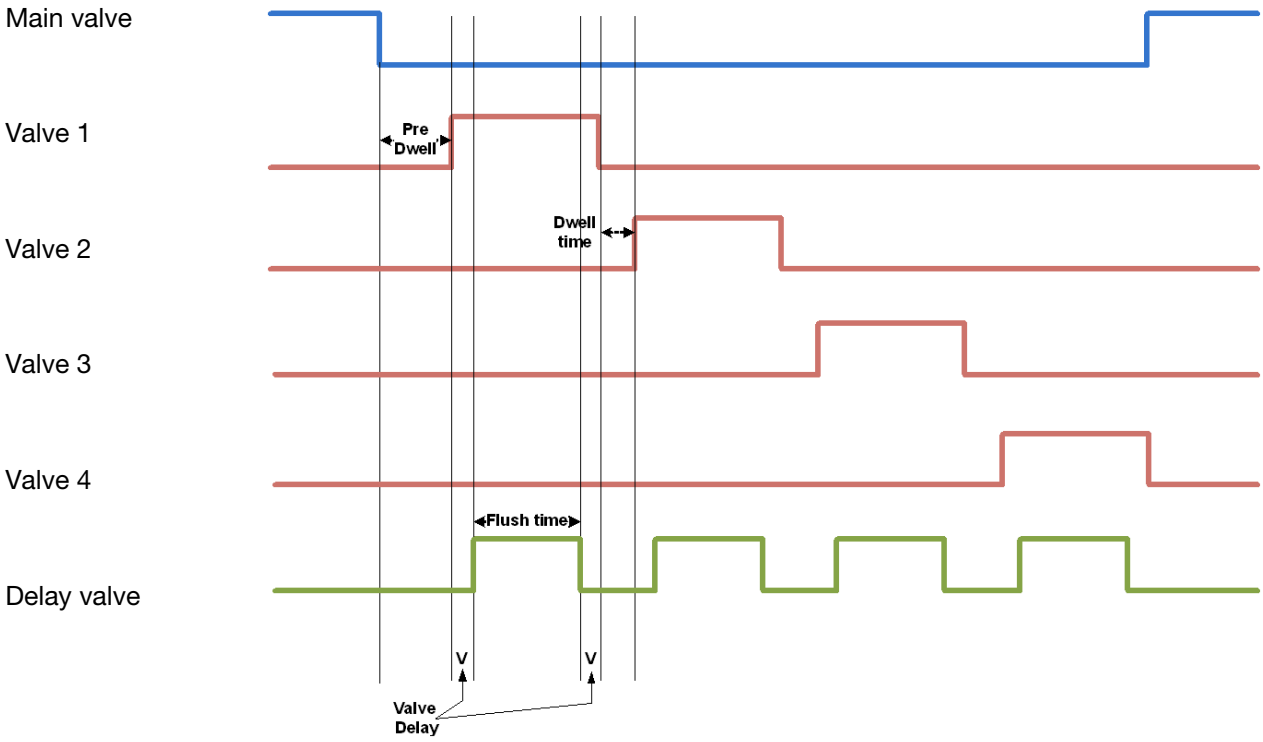
DC model (option):
Power supply:
- 6 V supplied by 4 x 1.5 V D size alkaline cells
- or a 12 V DC dry battery
- or a 12 V rechargeable battery with a 2-watt solar panel

Outputs: 12 V DC latching solenoids.
DP sensor:
Standard: external dry contact DP sensor.
Option: built-in electronic analogue DP sensor.
Pressure sensor: dry contact pressure sensor (option)
Ambient temperature: 0-60°C.

Timing diagram: **without delay valve**



with delay valve



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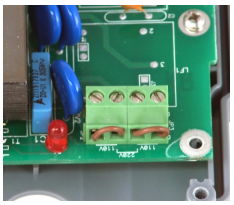
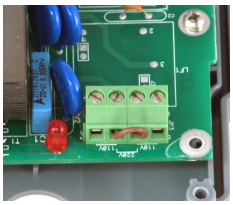
Wiring diagram, AC model:

The illustration below shows the wiring for the AC model of the controller.

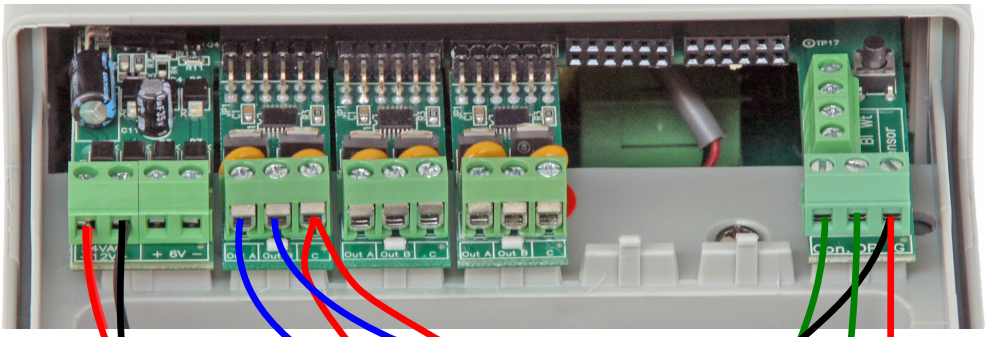
Note:
1. The external DP sensor is standard and is intended for use when the unit does not feature a built-in electronic DP sensor (option).
2. The unit is supplied with 24 V AC, internally transformed from 220/110 V AC.
3. Switch off the power before removing/adding a plug-in unit.

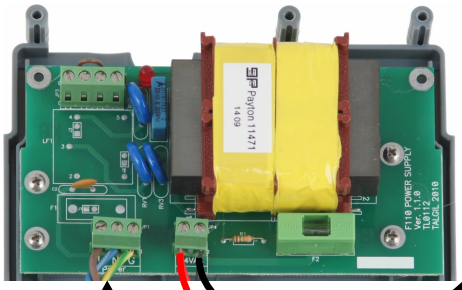


110V configuration



220V configuration





Power supply

24V AC

24V AC solenoids

Pressure sensor (option)

DP sensor

UVAR

Subject to modifications
No liability accepted for errors or misprints

Wiring diagram, DC model:

The illustration below shows the wiring for the DC model of the controller.

Note:
1. The external DP sensor is standard and is intended for use when the unit does not feature a built-in electronic DP sensor (option).
2. The unit can be supplied with 6 V or 12 V DC.
3. Switch off the power before removing/adding a plug-in unit.