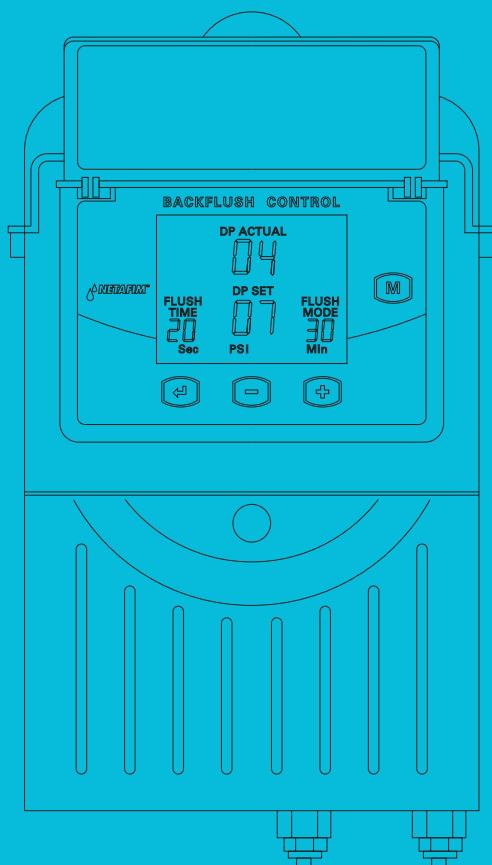


BACKFLUSH CONTROL

INSTALLATION AND OPERATION MANUAL



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NOTE

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LIST OF FEATURES

- The “BACKFLUSH CONTROL” is a modular backflushing controller for automatic filters of 1 to 10 stations
- There exist DC and AC models
- The DC model can be powered either by 6v DC or 12v DC and it activates 2 wired 12v DC latching solenoids. The voltage for the solenoids switching is boosted by a Main Latch card
- The AC model contains an internal transformer that can be powered by 110v or 220v from which it generates the 24v AC for the solenoids
- Flushing cycles may be triggered either by time or by the embedded electronic DP sensor reaching the set point, or by a dry contact signal from an external DP sensor
- Endless looping problems can be eliminated by detecting repeated consecutive cycles passing beyond a predefined limit
- The unit can optionally handle a Pressure-Sustaining / Main valve, and an Alarm output
- The unit is equipped with a customized LCD display and key board
- The unit counts separately the number of flushing cycles triggered by DP, by time and manually

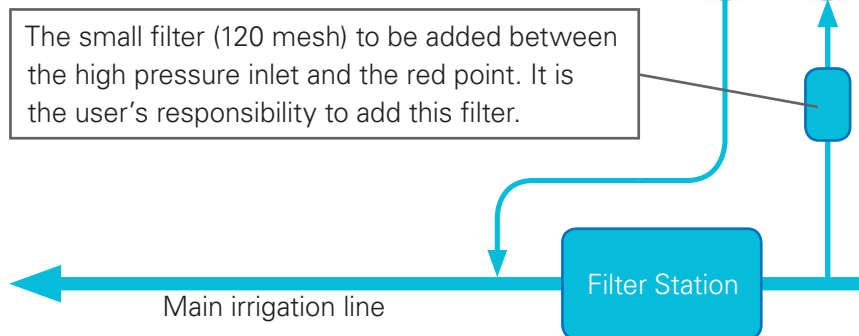


CONNECTING THE DP SENSOR TO THE FILTER SYSTEM

The DP sensor is connected to the filter system by 2 command tubes, the one which comes from the filter inlet (High pressure) will be connected to the red point, and the one that comes from the outlet (Lower pressure) will go to the black point. It is important to put a small filter of 120 mesh (not supplied) between the red point and the high pressure connection point.



The small filter (120 mesh) to be added between the high pressure inlet and the red point. It is the user's responsibility to add this filter.



WIRING DIAGRAM

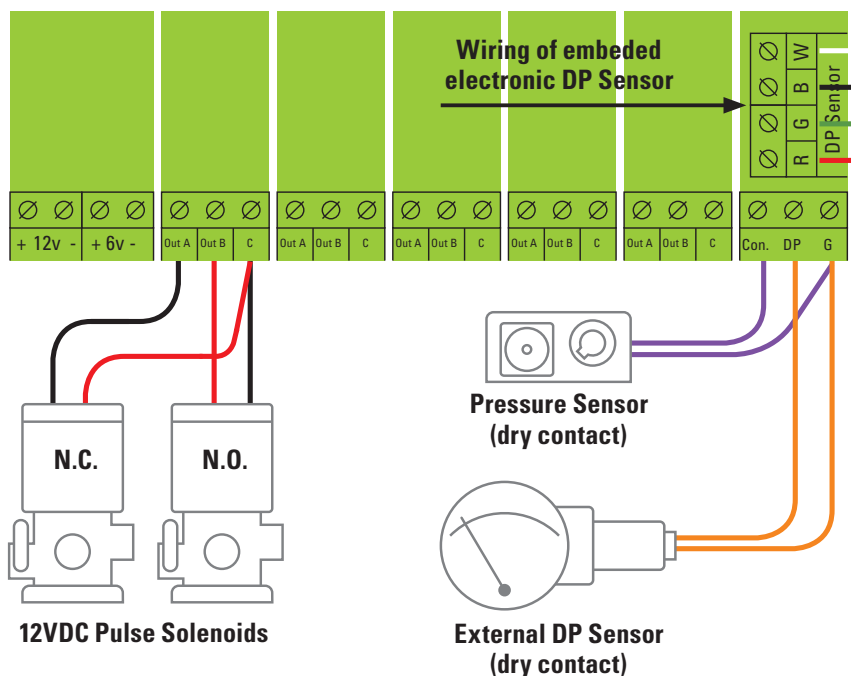
DC MODEL

The drawing below shows the wiring of the DC model of the controller.



NOTE

1. The External DP sensor is optional and it is intended for use in cases there is no Embedded Electronic DP included.
2. The powering of the unit can be either by 6v DC or 12v DC.
3. The solenoids will be of 12VDC latch.



NOTE

Make sure to DISCONNECT the POWER before inserting / removing the 2 outputs plug-in unit.

WIRING DIAGRAM

AC MODEL

The drawing below shows the wiring of the AC model of the controller.



NOTE

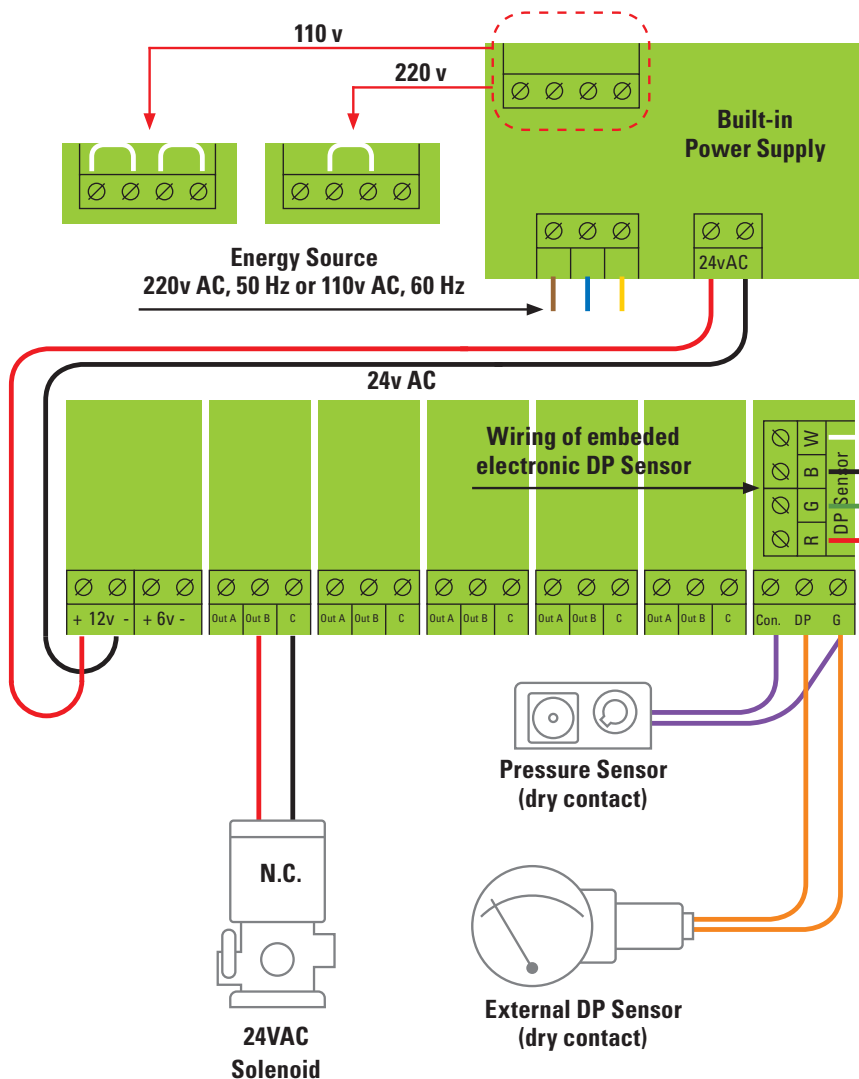
1. The External DP sensor is optional and it is intended for use in cases there is no Embedded Electronic DP included.
2. The powering of the unit is by 24VAC transformed from 220/110 VAC.
3. The solenoids will be of 24VAC.



NOTE

Make sure to DISCONNECT the POWER before inserting / removing the 2 outputs plug-in unit.

WIRING DIAGRAM

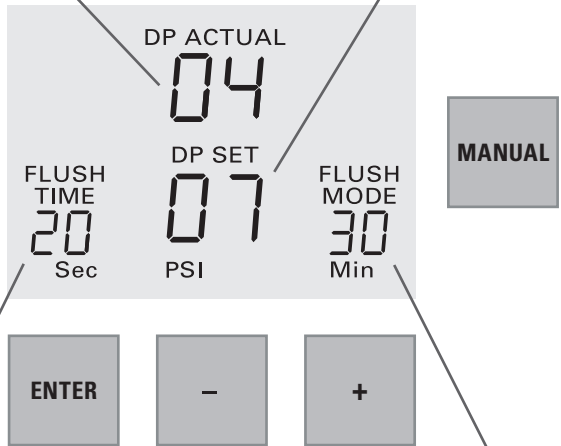


HOW TO PROGRAM THE CONTROLLER

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 Actual DP value. Available only when the built in electronic DP is used. DP values are in BAR or PSI.

The DP Set-Point. Available only when the built in electronic DP is used. Set-Point units are in BAR or PSI.



The desired flushing time per station

The desired flushing mode. Contains either the flushing interval or the letters "dp" when the flushing is triggered by dp only

HOW TO PROGRAM THE CONTROLLER

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.

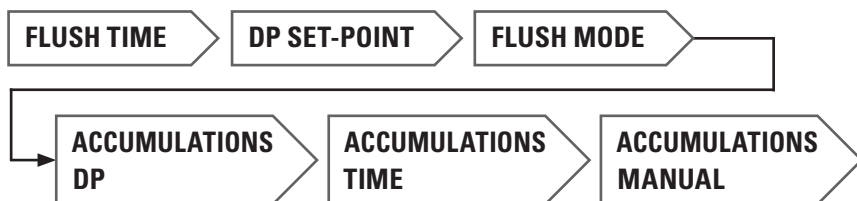


NOTE

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 chain of editable fields

Following is the chain of editable fields. The existence of the DP SET-POINT field depends on whether the system contains a built-in electronic DP or not.



HOW TO PROGRAM THE CONTROLLER

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

DP Set Point

At this field the user defines the pressure difference between the filter's inlet and outlet that when reached, a flushing cycle will take place. This field is meaningless when electronic DP sensor is not in use, therefore the user is expected to define the DP set point to be 00, as a result the actual DP value will appear as (- -).

When the pressure is expressed in BAR

the range of values is 0.1 – 2.0 BAR.

When the pressure is expressed in PSI

the range of values is 1- 30 PSI.

When the system does not include the built in electronic DP sensor but uses instead an external DP sensor, the flushing request signal arrives in the shape of a closed dry contact at the appropriate input terminals.

Flush Mode

The Flush Mode defines how the flushing cycles is triggered. The selectable options are as follows:

HOW TO PROGRAM THE CONTROLLER


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

If the "+" and "-" keys are pressed and held down simultaneously the "Flush Mode" field will show the left time until next cycle, alternately hours and minutes.

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.

Accumulations

The unit accumulates and displays the number of flushing cycles caused by DP, by time, or manually.

At each of the accumulation fields, the "+" or "-" keys may be used for clearing the accumulated value.

HOW TO PROGRAM THE CONTROLLER

Configuration

In order to enter into the configuration process press and hold down the ENTER key for at least 3 seconds.

The unit will detect how many “plug-in” boards (each of 2 outputs) are used in the particular case.

How will the outputs be allocated depends on the definitions made 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:

Assuming there are 3 “plug-in” boards, this makes 6 outputs for use. If there are no Alarm-output, no Delay-Valve and no Main-Valve all the 6 outputs will be allocated for backflush valves.

If additionally a Main-Valve is defined, the first 5 outputs will be allocated for backflush valves and output No 6 for the Main-Valve. Output No 5 (of the last backflush valve) can be canceled and left unused. If additionally a Delay-Valve is defined it will be allocated to output 5 right before the Main valve, leaving the first 4 outputs for backflush valves, and once again output No 4 (of the last backflush valve) can be canceled and left unused. If additionally an Alarm-output is defined it will be allocated before the Delay-Valve leaving only 3 of the first outputs for backflush valves. No 3 can again be canceled.

HOW TO PROGRAM THE CONTROLLER

During the configuration process the following features are defined:

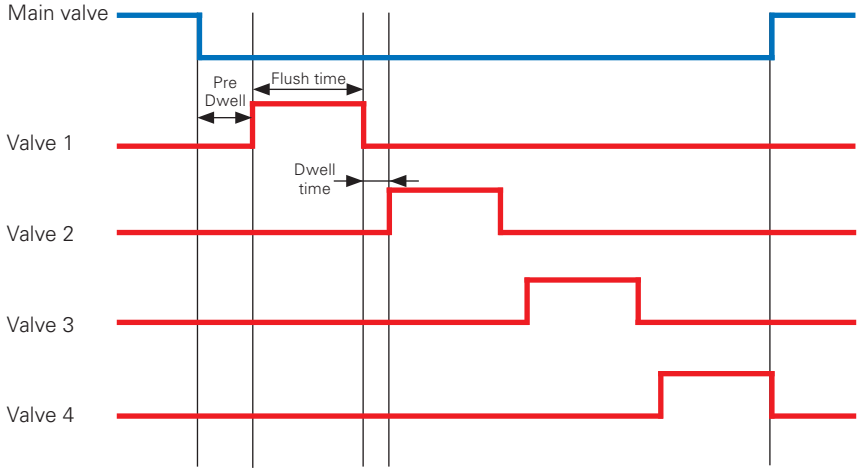
Main Valve (sustaining valve)	Yes/ No. When the answer is “Yes” the Pre Dwell delay between the Main Valve opening and the opening of Station No. 1 can be defined. The selectable delay steps are: 5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 55 sec 1, 1.5, 2, 2.5, 3, 3.5, 4, 4.5, 5, 5.5, 6 min
Dwell time	the delay between stations – can be set to 5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 55, or 60 sec.
DP delay	the delay during which the DP sensor reading is expected to remain stable before reaction – 5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 55, 60 sec.
Looping limit	the number of consecutive flushing cycles triggered by the DP sensor before deciding that there is an endless looping problem. The options are: 1-10 or “no” which means ignoring the looping problem.
Alarm	Yes/No – allocating one output for alarm activation.
Delay Valve	Yes/No – allocating an output for Delay Valve activation.
View Outputs	this is a special mode that enables passing through the list of outputs to see how each output was allocated. Use the + key to change the “no” into “yes” and confirm by “Enter”, then keep using the + key to pass through the list. At the bottom left corner the ordinal number of the output is displayed and its allocated function appears in large letters at the center of the screen. Notice that the number of possible outputs that can be used is always an even number since it results from the number of “plug in” boards (each of 2 outputs) included. However if the number of outputs needed is not an even number, then the last valve allocated for flushing may be canceled by use of the M manual operations key.

HOW TO PROGRAM THE CONTROLLER

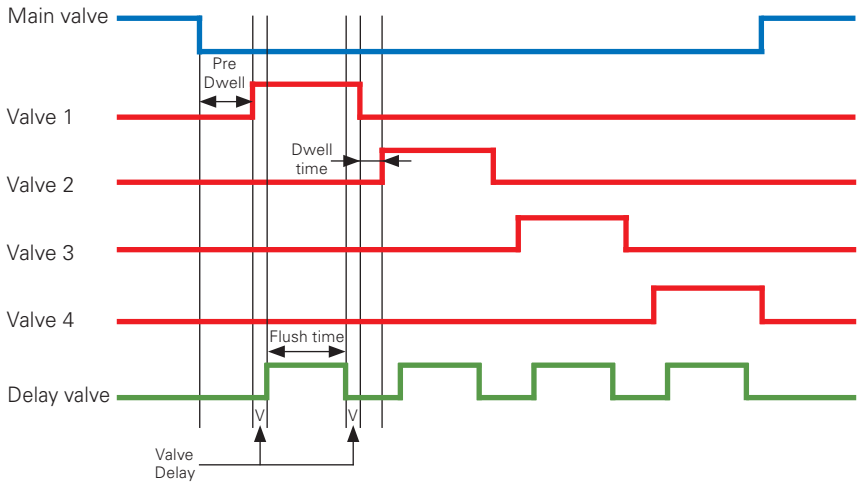
Pressure units	deciding about the units to be used for pressure measurement. Selecting between BAR or PSI .
Calibration	Zero calibration of the built in electronic DP sensor. While the sensor ports are disconnected from the tube and open to atmospheric pressure, then select Calibration = Yes.
Version display	The last screen of the configuration supplies information about the software version of the controller. the version consists of 4 digits like the following: 00, 13.

TIMING DIAGRAM

Without Delay Valve



Including Delay Valve



TECHNICAL DATA

DC MODEL

Power source:	6v supplied by 4 x 1.5 "D" size alkaline batteries. or 12v DC dry battery. or 12v rechargeable battery with solar panel of 2 watts.
Outputs :	12v DC latching solenoids.
DP:	Embedded electronic analog DP sensor. or external dry contact DP sensor.
Pressure Sensor:	Dry contact pressure sensor.
Operating temperature:	0-60°C (32-140°F).

AC MODEL

Power source:	220 or 110 v AC 50 or 60 Hz with built in transformer to 24v AC.
Outputs :	24v AC solenoids.
DP:	Embedded electronic analog DP sensor. or external dry contact DP sensor.
Pressure Sensor:	Dry contact pressure sensor.
Operating temperature:	0-60°C (32-140°F).

TROUBLESHOOTING


The following instructions are for the Netafim Backflush Controllers - 12VDC latching and 24VAC models.

Handling Endless Looping problems


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.

Handling 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.

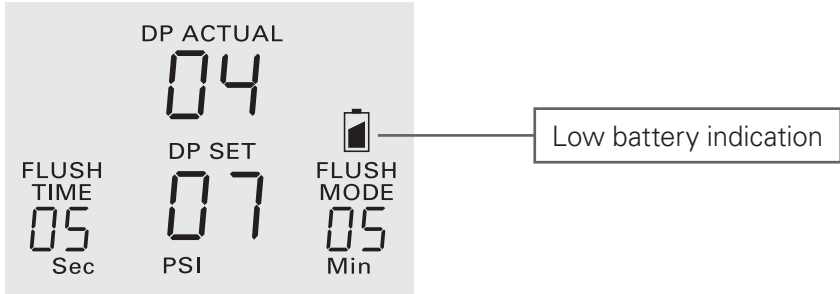
Low battery

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.

TROUBLESHOOTING

Possible Power Problems

DC Latch Version: Low Battery indication is ON.
In this case the batteries need to be replaced.



When the display is blank and the keyboard does not respond:

Remove the upper cover:

a.



b.



TROUBLESHOOTING

DC Latching Model

Check that all batteries are properly installed.

a.



b.



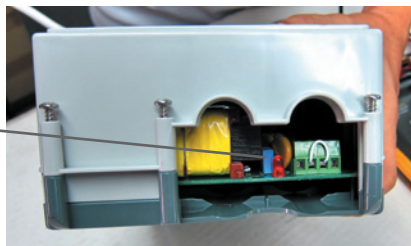
Check the voltage on the Main Card. Required voltage is 6 volts DC. If the voltage is lower than this, replace the batteries. If the voltage 6 volts DC, then replace the Main Card (see directions in Section 2).



AC Model

Check the power indicating LED, it should be ON.

Power indicating LED



If the LED is ON

Check the voltage on the Main Card. Required voltage is 24 volts AC. If the voltage is lower than this, replace the Main Board (see directions in Section 2).

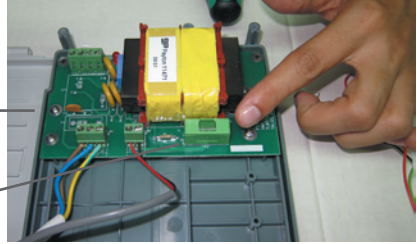
TROUBLESHOOTING

If the LED is OFF

Option A. The fuse is blown and needs to be replaced.

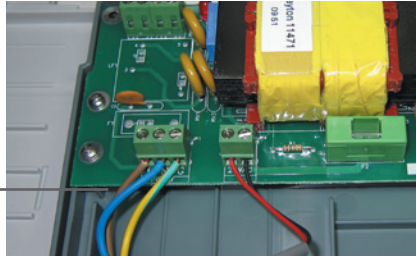
Power supply unit

The fuse (2 Amp)



Option B. No power arriving from the main Wires - 110 VAC required.

Power from the mains wires between the brown and blue wires



Option C. The power supply is damaged, replace power supply (see directions in Section 2).

TROUBLESHOOTING

General Reset

Peripheral electromagnetic interferences or surge can cause a controller to malfunction. When such an event occurs, resetting the unit may help to solve the problem.

a. Remove lower cover



b. Push reset button



DP Sensor Shows Wrong Value

The DP ACTUAL on the display is blank or it shows a constant value which does not respond to differential pressure changes:

Option A. Incorrect wiring of the sensor
Check the wire connections.



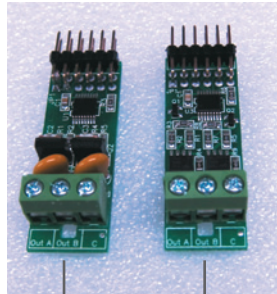
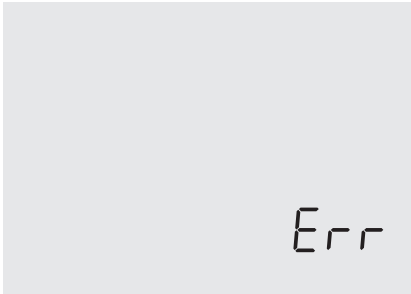
TROUBLESHOOTING

Option B. The high and low pressure 8mm tubes (at the controller inlets - red and black) of the DP sensor are disconnected or blocked by dirt.

Option C. The sensor is damaged. Replace the sensor (see directions in Section 2). If there is no replacement sensor available, leave the sensor disconnected and let the controller work by time only.

When an “Err” Appears on the Screen

When an “Err” symbol appears on the screen, there is no output expansion cards connected to the main board.



Output expansion
AC plug-in board

Output expansion
DC plug-in board

TROUBLESHOOTING

When an Output does not Function

DC Latching Model

In the DC latching model, there is a possibility that all outputs will not function (respond). The Main Latch Card may be damaged and should be replaced.

Main Latch Card



Output does not Respond – DC Latching and AC Models

When a single output/solenoid doesn't work, the recommended action is changing the wires from the non-working solenoid to another output solenoid which is functioning properly.

Option A. If the solenoid works properly at the new location, the output card from the previous location need to be replaced.

Option B. If the solenoid doesn't work at the new location, the solenoid is damaged and should be replaced.

REPLACEMENT INSTRUCTIONS

Dismantling the Enclosure

Remove the upper cover:

a.



b.



Slide down the front lower part of the box:

a.



b.



REPLACEMENT INSTRUCTIONS

Disconnecting the Power

DC Latching Model

a. Pull out the battery housing:



b. Remove one of the batteries:



c.



d. Disconnect the 6v DC supply wires:



e.



REPLACEMENT INSTRUCTIONS

AC Model

- a. Disconnect the power cord from the Main Power Supply:



- b. Disconnect the 24 VAC supply wires:



c.



Removing the Output Expansion Cards

Prior to removing the output expansion cards, check that the power is disconnected as described in Section 2.2.

- a. Hold the unit firmly, pull the expansion card back and lift it slightly:



REPLACEMENT INSTRUCTIONS

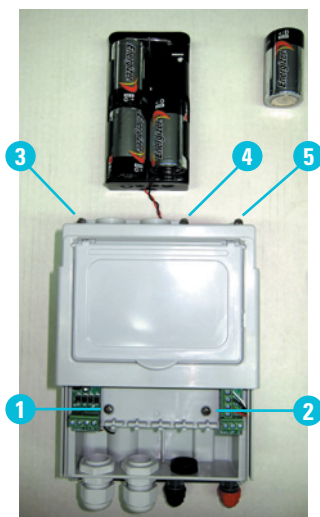
b. Pull out the expansion card one by one:



Disassembling the Enclosure

There are 5 screws holding the enclosure together:

Use a (+) screwdriver to release the 5 screws.



a.

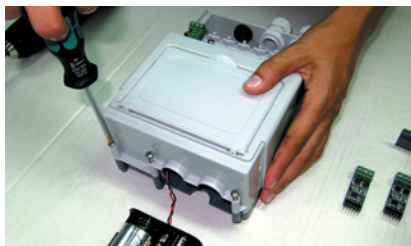


b.

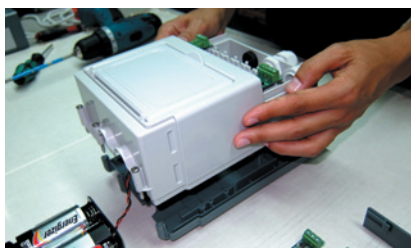


REPLACEMENT INSTRUCTIONS

C.



Lift the upper part of the box to separate it from the lower part:



With the DC Latching Model, the upper and lower parts can be easily separated, but with the AC Model, the power cord holds the two parts together:

a. DC Latching Model



b. AC Model



REPLACEMENT INSTRUCTIONS

Removing the Analog DP Sensor Unit

Disconnect the sensor wires from the board:

a.



b.

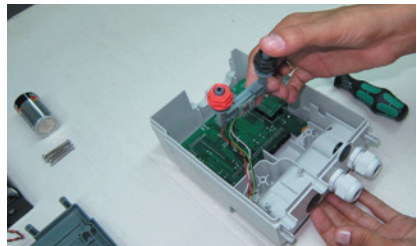


Hold the front of the enclosure and lift out the DP sensor:

a.

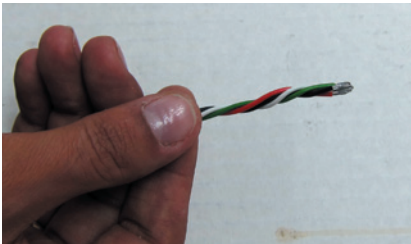


b.

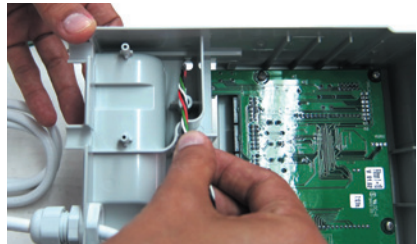


Reinstalling an Analog DP Sensor

Twist the wires of the sensor together:



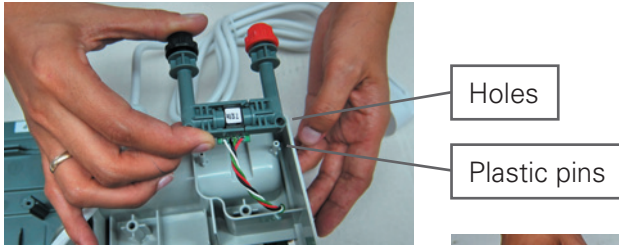
Push the twisted wires through the hole from back to front:



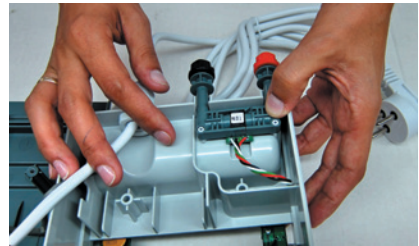
REPLACEMENT INSTRUCTIONS

Positioning the PD sensor

- a. Hold the sensor with the holes facing the two plastic pins and with the red fitting next to the enclosure wall:

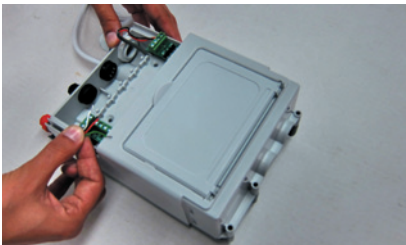


- b. Push the PD sensor down, verifying that the plastic pins are through the holes.

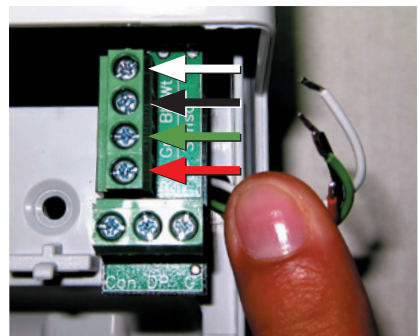


Connecting the wires to the terminal block

- a. Position the enclosure with the front side up.



- b. Connect the PD sensor wires to the terminal block according to the color indicators.

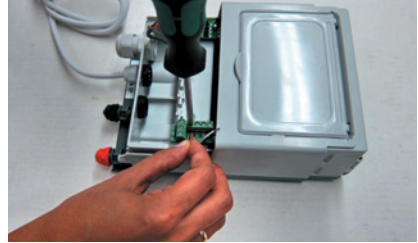


REPLACEMENT INSTRUCTIONS

c.

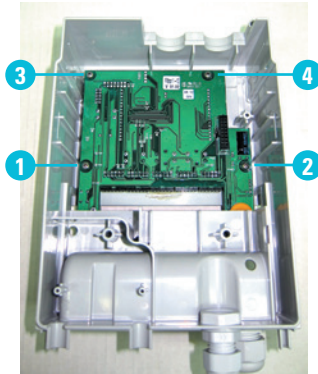


d.



Removing the Main Board

- a. Disconnect the power from the unit as described in Section 2.2
- b. Remove the output expansion cards as described in Section 2.3
- c. Open the enclosure as described in Section 2.4
- d. Turn down the front part of the enclosure, release the 4 screws holding the main board to the enclosure.

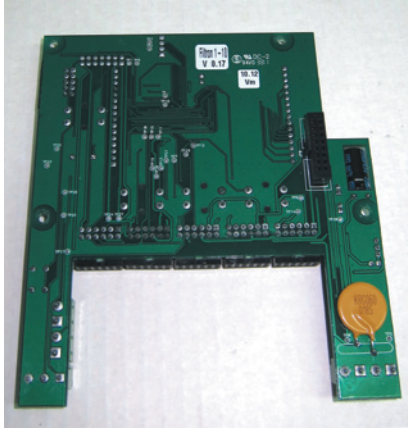


NOTE

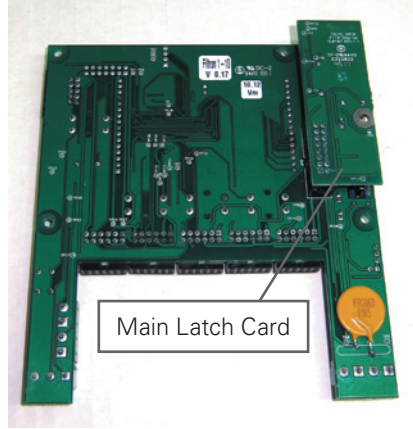
There is a difference between the main board of the DC Latching and AC models. Only the DC Latching model includes a Main Latch Card.

REPLACEMENT INSTRUCTIONS

AC Model



DC Latching Model



Removing/Replacing the Power Supply Module – AC Model Only

- Follow the steps described in Sections 2.1; 2.2; 2.3; 2.4.
- Disconnect the power cord and the 24VAC wires.
- Remove the 6 screws holding the power supply to the enclosure and replace the Power Module.



WARRANTY

Controller:

Netafim warrants the electronic components of the Backflush Controller on to be free of defects in materials or workmanship for 1 (one) year from the date of purchase by end user. If a defect is discovered during the applicable warranty period, Netafim will repair or replace, at its option, the product or the defective part.



NOTE

Lightning and surge damages are not covered by warranty.

Date of commissioning:

Customer Representative:

.....

.....

Netafim's Representative:

.....

.....

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