FILTRON MAS [AC]
USER GUIDE

GOLDTEC
CONTROL SYSTEMS

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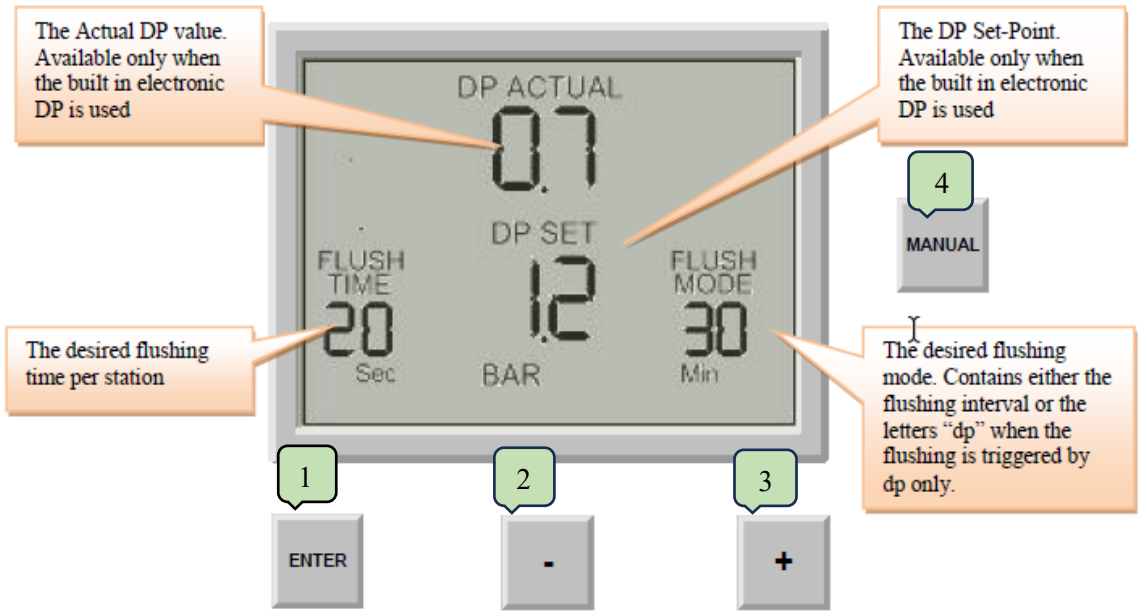
General description:

1. The FILTRON MAS function is to control backflush of the filter when needed.
2. In order to backflush the filter:
   a. Count interval time / DP trigger should be received for DP delay period / manual press.
   b. The PUMP (if exist) or DOWN STREAM (if exist and entered in looping state) are activated.
   c. After PRE-DWELL (default – 2 sec.) open the backflush valve.
   d. After DWELL (default – 2 sec.) open the engine: from A to B or from B to A, depending on the START position.
   e. When reaching the engine limit switch, all stops until next trigger.

Controller front panel:

- The controller arrives with a power supply that can be powered by 110V AC or 220V AC from which it generates. The output of this power supply is 24V AC to power the controller and to operate the solenoids.
- Backflushing cycles may be triggered either by time, by internal Analog DP or Manually.
- 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.



1) Enter button:

a. Short press – wakeup or change values on Main screen.

b. Long press (for 3 seconds) – enter in configuration menu.

2) Decrease value

3) Increase value

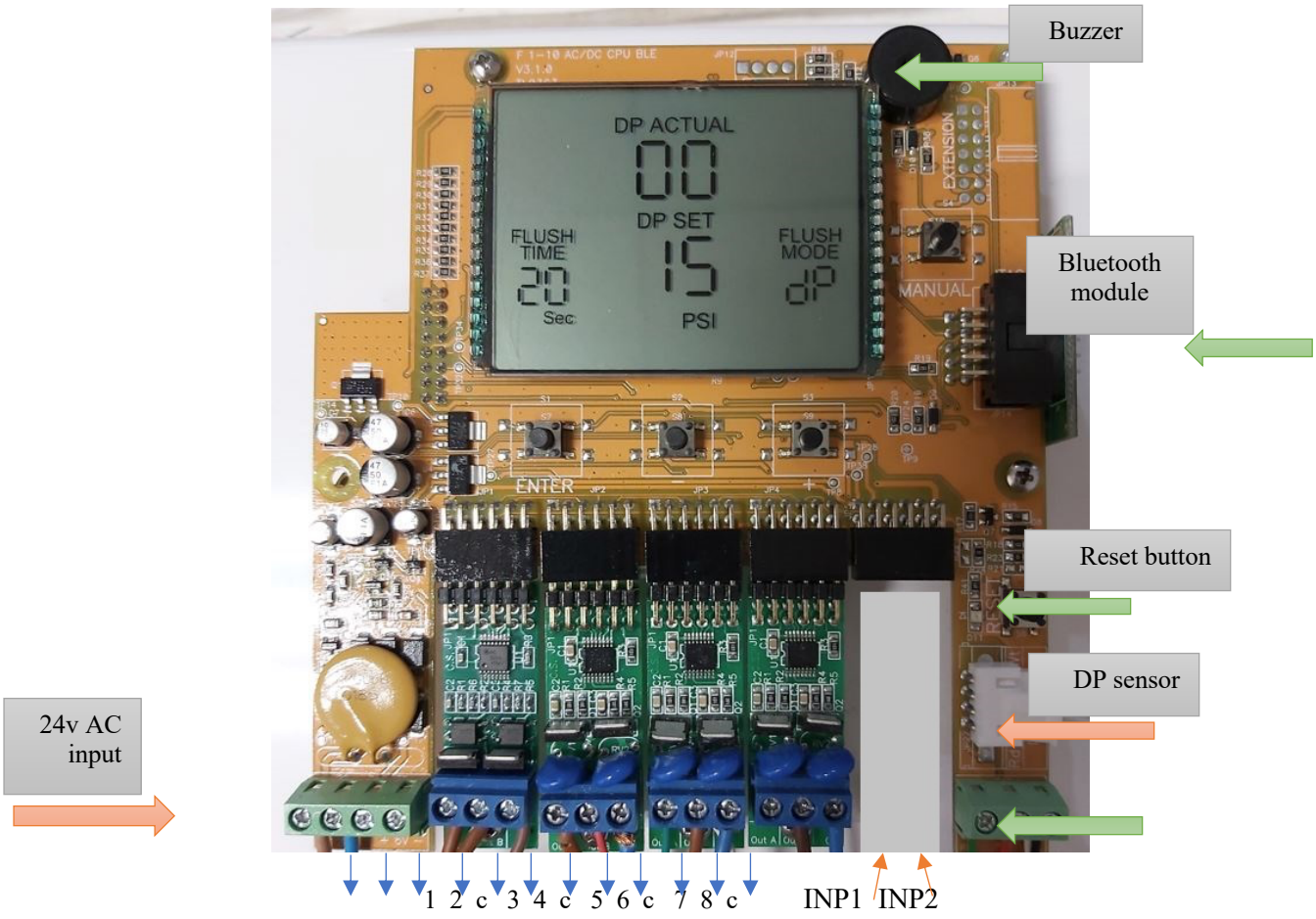
4) Start manual flushing procedure

Programming 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. 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. By making changes, user can easily configure desirable flushing procedure.

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.

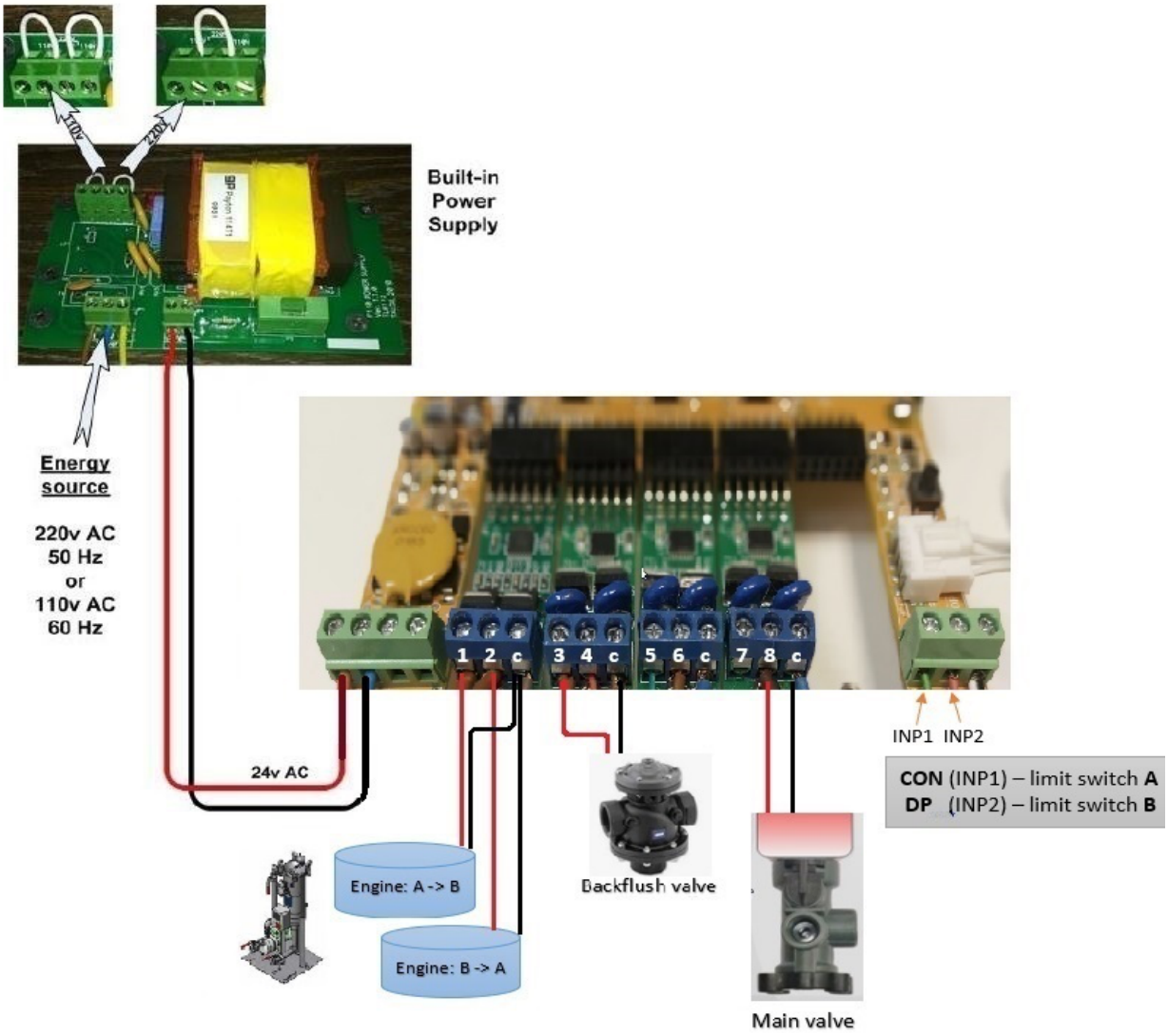
Controller board + LCD screen:



Notice: After 1 minute of buttons inactivity – LCD display shutdown, but controller continue regular functionality. To wake up the display press any button. Buzzer (if activated) will sound only when LCD display in sleep mode.

Hardware and wiring outputs/inputs:

Make sure to DISCONNECT the POWER before inserting / removing plug-in units.



1. The controller will be powered with built-in PS 24V AC outputs.

(The powering of the unit is by 24VAC transformed from 220/110 VAC).

2. The FILTRON MAS configuration include:

a. 4 expansion cards = 8 outputs (first expansion card is special board).

b. Input for analog internal DP sensor.

c. 2 onboard digital inputs (engine A, B)

d. Bluetooth extended card.

Outputs:

1	2	3	4	5	6	7	8
Engine ➔B	Engine ➔A	Backflush valve	Alarm 1	Alarm 2 (Malfunction)	Backflush indication for external controller	Spare/ Reserved	Main valve

Digital inputs (onboard):

CON (**INP1**) – limit switch A (**normally closed**).

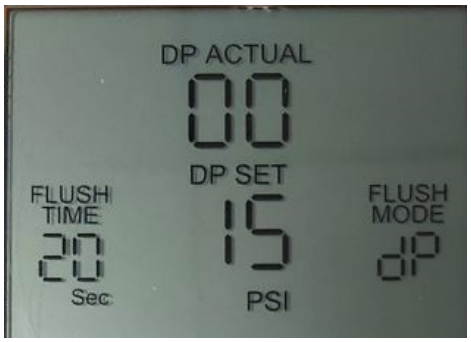
DP (**INP2**) – limit switch B (**normally closed**).

Analog input:

Internal DP sensor (measures differential water pressure).

(On the controller LCD screen: **DP ACTUAL** – show parameters for actual water pressure)

Main screen (press Enter to change values):



1. **FLUSH TIME** – flushing period range of values: 20 sec, 25, 30, 35, 40, 45, 50, 55, 1.0 min, 1.1 (70 sec), 1.2 (80 sec), 1.3 (90 sec), 1.4 (100 sec), 1.5 (110 sec), 2.0 (120 sec).
2. **DP SET** (units can be choose in Configuration ➔ Pressure units ➔ PSI or Bar) - user defines the pressure difference between the filter's inlet and outlet that when reached, a flushing cycle will take place.

When the pressure is expressed in BAR the range of values is

0.1 – 1.0 BAR.

When the pressure is expressed in PSI the range of values is

1 – 15 PSI.

3. **FLUSH MODE:**

a. **OFF** (Suspended) - no flushing will take place.

b. **dp** – flushing will be triggered by DP only.

c. **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

During FLUSH procedure:

a. In case of Main valve in mode with Pump selected, count down PRE-DWELL (in case of Down Stream mode selected - countdown PRE-DWELL only in looping state).

b. While only backflush valve is open – show only. DWELL delay counting.

c. When both backflush valve and engine are ON, show:

F1

F1b F1a

F1b when going to B and F1a when going to A. FLUSHING blinks.

4. **Accumulations screen** – counters for FLUSH procedure occur: by DP, by Time, by Manual. To reset counters press "+" or "-".

Configuration screens (press Enter for 3 sec.):

1. Main valve screen allows choosing between 3 options:

ds **pu** **no**

Down Stream Pump None

If **PU** or **DS** (when in looping) are selected – PRE-DWELL delay appears (delay between opening Main valve and opening backflush valve).

Range of values is: 2, 3, 4, 5, 6, 7, 8, 9, 10 seconds (default – 2 sec.).

If "**no**" selected – main valve (output 8) is not use.

2. **DWELL** – delay between backflush opens and engine opens (A or B)

Range of values: 2, 3, 4, 5, 6, 7, 8, 9, 10 seconds (default – 2 sec.).

3. **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.

4. **Looping** - the number of consecutive flushing cycles triggered by the DP sensor before deciding that there is an endless looping problem. The options are: 4 – 10 times (default – 10 times). When exceed counter limit – enter in Malfunction state.

5. **Pressure units** – choose which one of units for measuring pressure to use (PSI or Bar).

6. **Calibration** - zero calibration of the built-in analog DP sensor. Proceed with calibration only when the sensor ports are disconnected, select Calibration = Yes.

7. **Version** - screen of the configuration supplies information about the software version of the controller. the version consists of 4 digits like the following:

01 00

8. **Buzzer** – select ON/OFF the sound. When selected – ON:

a. 3 beeps on start/reset

b. In sleep mode (LCD screen not activated) – normal functionality: 2 beeps every 20 seconds, in Malfunction mode – 4 beeps continuously.

c. Beep sounds on Bluetooth connection with application + connection LED turns ON.

Buttons functionality and combinations:

Notice: when controller connected with Bluebits application (Bluetooth)- all buttons (except "Reset" button) becomes inactive. For return to use controller's buttons – application need to be closed.

- When LCD display in sleep mode – press any button to wake up
- Button "Manual" – starts the FLUSH procedure.
- Button "Reset" – Hard reset of controller.
- Release from Malfunction –

1. Buttons: "Reset" or "Manual" pressed for 3 seconds.
2. "Clear Malfunction" option from application.

- Enter button:

Short press – transition between Main screen parameters,"+" or "-" to increase/decrease values.

Press for 3 seconds – enter to configuration screens, "+" or "-" to increase/decrease/changes values.

- Time to next FLUSH – when controller in Time & DP mode, press simultaneously "+", "-". On display shows time remain to next designed FLUSH procedure.
- Check LCD display – press simultaneously and hold "Enter", "+", "-" buttons, than press "Reset" button. LCD display checking procedure starts.
- Checking Outputs - press simultaneously and hold "Enter", "+", "-" buttons, than press "Reset" button. During checking LCD press

"Enter", Outputs checking starts – press "Manual" to pass all Outputs. After finished reset the controller.

- Reset to Factory settings – press and hold "Manual" button and press "Reset". Controller restart and return to default settings, including default name.

Possible faults and Alarms:

1. Checking actual DP value (every 5 seconds). In case of high pressure: more than 1 Bar (14 PSI) -> Alarm activated (Icon blinking) + and FLUSH starts, more than 3 Bar (43 PSI) -> Malfunction detected.
2. DP sensor disconnected – Alarm activated.
3. FLUSH looping procedure: after 3 loops of flushing in sequence occurs, Alarm activated + continue flushing until achieves looping counter limit. After that – Malfunction received.
4. Out of place: in case that the engine not reached to one of the limits (A or B) – Malfunction received: "Status: Limit switch A (B)".
5. In case of Malfunction: closing all outputs, open Alarm2 output (icon constantly ON, all other are OFF) and stay in this state until:
   a. Hard reset
   b. Press 3 seconds on Manual button
   c. Release from application.

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