SPIN KLIN
Automatic Backwash Filtration Systems
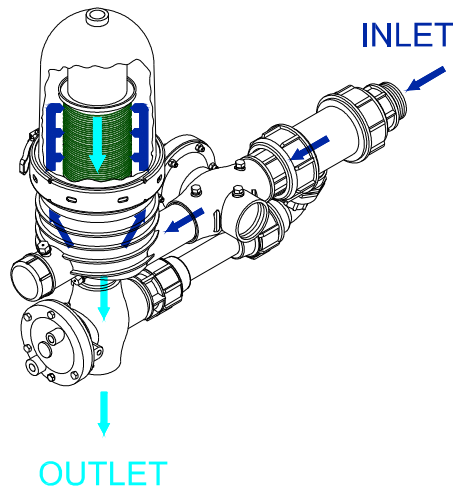# 2″ Compact Stand Alone (new)

Service & Maintenance Manual

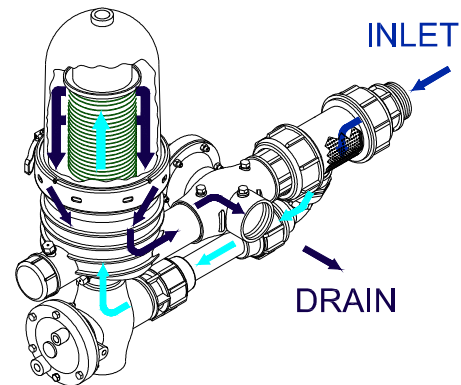## Mode of Operation

Filter in
Filtration mode

Filter in
Backwash mode

INLET

INLET

OUTLET

DRAIN

The Filtration Process

Water flows through the inlet valve via the bypass filter pipe and into the 2" SPIN KLIN filter where it is filtered. The filtered water then flows through the outlet valve, for downstream use.

The Backwash Process

Command based on pressure differential or time settings is sent from the controller to (two) separate components in the filter:
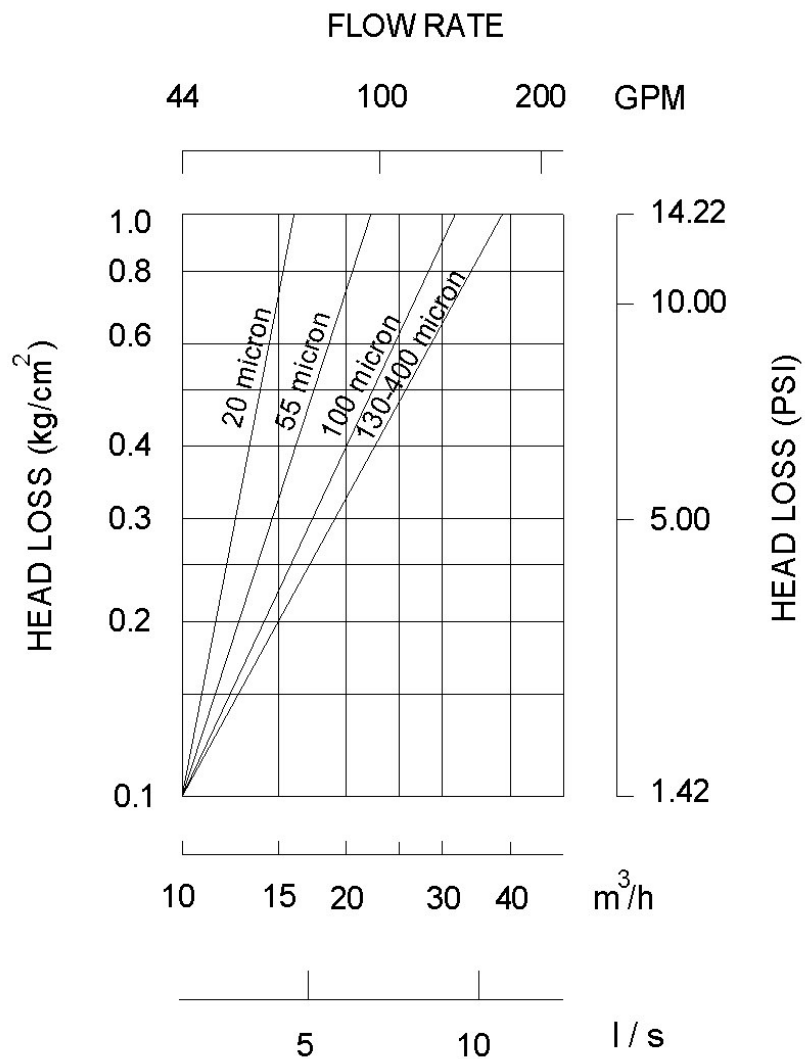
1. Inlet valve Enters backwash mode (entrance closed, drain opens).
2. Outlet valve Enters backwash mode (downstream closed, filter bypass opens).
Water flows via the bypass filter screen, through the bypass into the outlet valve. It enters the main filter (which is open), where jets of water flush the grooves in the discs as the discs spin. The water carries away impurities toward the inlet valve. At the end of the backwashing process (20 seconds) the backwash command is withdrawn, the discs are compressed and the SPIN KLIN returns to the filtration mode. The inlet and outlet valves return to the filtration mode. Water flows once again into the filter, carrying with it the impurities that are collected on the bypass filter screen during backwash.

Technical Data

Parameters	METRIC	US
Maximum pressure	10 bar	145 psi
Maximum flow rate	20 M^3/h	88 gpm
Minimum flow rate	8 m^3/h	35 gpm
Minimum backwash pressure	2.8 bar	40.6 psi
Filtration surface area	880 cm^2	136.4 in^2
Filtration volume	1320 cm^3	80.5 in^3
Backwash water volume	33 liters	8.7 gal

Head Loss Chart

Initial Installation & Operation Instructions

A. Installation

1. Remove from package, check contents.
2. Ensure correct orientation of INLET & OUTLET.
3. Connect the BACKWASH pipe to the Drain port.
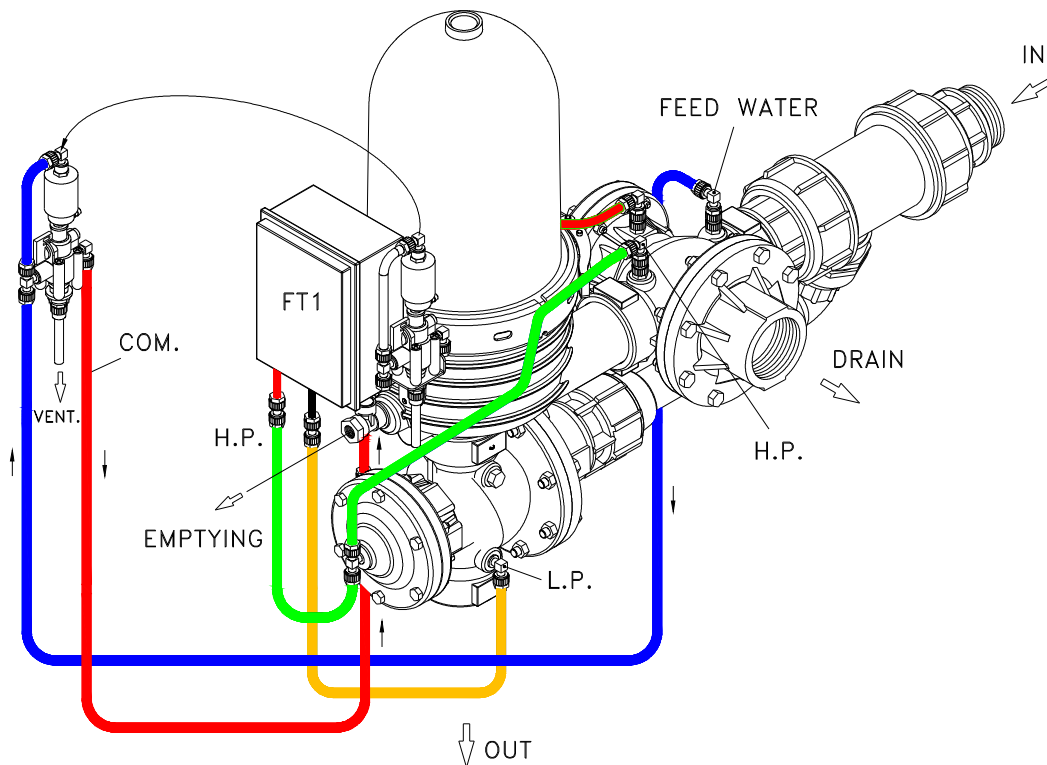4. Check that the filter cover is closed correctly.

B. Controller

1. Refer to manufacturer's handbook before installing controller.
2. Check that the power is suitable for the solenoids & controller.
3. Make sure the solenoid manual switch is set to automatic.
4. Check that the pressure differential gauge is connected to the appropriate outlets – the high pressure & low pressure pipes (High pressure is to the center of differential pressure meter).
5. Set the starting point on the P.D. GAUGE to 5m (7 psi) above the filtration level.

C. Start Up Operation

1. Start backwash cycle. Check that the system is functioning correctly (to achieve maximum flushing effectiveness, use a minimum pressure of 2.8 bar (40.6 psi).
2. The bypass filter can be cleaned manually.

Initial Operation

1. Gradually open the inlet valve (make sure that the outlet valve, if installed, is open).
   WARNING Take precaution while operating the filter as the filter may enter the backwash mode automatically, without prior warning.
2. Check the filter assembly and its connections for leaks.
3. Perform a backwash cycle by disconnecting the low-pressure tube from the differential pressure indicator (closing of the electrical circuit) – re-connect it immediately as backwash starts.
4. Verify that the hydraulic backwash valve closes after 20 seconds.
5. Verify that the backpressure during backwash is at least 28m (40.6 psi).
6. When the filter is clean, verify that the differential pressure between inlet and outlet does not exceed 3 m (5 PSI).
7. Check that the differential pressure indicator is set to 5m (7 psi)
8. Perform an additional backwash cycle manually by rotating the operation handle (turn clockwise 90°) located on the solenoid valve

Maintenance & Periodical Checks

1.5V Battery Replacement

The 1.5V battery enables the electronic control unit's operation. The battery can last for 3000 flushing cycles, but should be replaced every six months. Use **ONLY ALKALINE** type battery.

1. Remove the front cover of the electronic control unit
2. Disconnect and remove the used batteries.
3. Connect new batteries according to the correct polarity.
4. Secure the electronic control unit-cover with the plastic cover.
   WARNING Take precaution while operating the filter as the filter may enter the backwash mode automatically, without prior warning.
5. Perform a backwash cycle by disconnecting the low-pressure tube from the differential pressure indicator (closing of the electrical circuit) – re-connect it immediately as flushing starts.
6. Verify that the hydraulic backwash valve closes after 20 seconds.
7. Perform an additional backwash cycle manually, by rotating the operation handle (turn clockwise 90°) located on the solenoid.

FILTRON FT1+DP 3W (DC)

- The "FILTRON FT1+DP 3W" is a backwashing controller for a single station automatic filter.
- For accuracy and simplicity of use, the controller has been equipped with an electronic DP sensor (Differential Pressure sensor).
- The unit activates 3 wired 12v DC latching solenoid.
- For convenience, the controller can be powered either by 6v DC or 12v DC.
- The system will detect problems of endless looping if after 7 consecutive cycles; the DP sensor keeps demanding the start of a new cycle.

Setting the interval between cycles and the flushing time per station

Setting the interval between cycles and the flushing duration is done through two blocks of dip switched S1, and S2. The following table summarizes the various possibilities:

INTERVAL BETWEEN CYCLES			FLUSHING DURATION		
1 – ON 0 - OFF	S1 1 2 3 4	meaning	1 – ON 0 - OFF	S2 1 2 3 4	meaning
01	0 0 0 0	**DP only**	01	0 0 0 0	5 sec.
02	1 0 0 0	5 min.	02	1 0 0 0	8 sec.
03	0 1 0 0	10 min.	03	0 1 0 0	10 sec.
04	1 1 0 0	15 min.	04	1 1 0 0	12 sec.
05	0 0 1 0	20 min.	05	0 0 1 0	16 sec.
06	1 0 1 0	30 min.	06	1 0 1 0	20 sec.
07	0 1 1 0	45 min.	07	0 1 1 0	25 sec.
08	1 1 1 0	1 hour	08	1 1 1 0	30 sec.
09	0 0 0 1	2 hours	09	0 0 0 1	45 sec.
10	1 0 0 1	4 hours	10	1 0 0 1	1 min.
11	0 1 0 1	8 hours	11	0 1 0 1	1.5 min.
12	1 1 0 1	12 hours	12	1 1 0 1	2 min.
13	0 0 1 1	18 hours	13	0 0 1 1	3 min.
14	1 0 1 1	24 hours	14	1 0 1 1	4 min.
15	0 1 1 1	72 hours	15	0 1 1 1	5 min.
16	1 1 1 1	120 hours	16	1 1 1 1	6 min.

Installing the DP sensor

The DP sensor is equipped with 2 command tubes by which it should be connected to the filter. The red tube goes to the higher pressure (at the inlet), and the black tube to the lower pressure (at the outlet). It is important to put a small filter of 120 mesh between the red tube and the high pressure point.

Defining the set-point of the electronic DP sensor

The set point of the electronic DP sensor is defined by the dip switch block S3 as shown in the following table. As long as the pressure difference is lower than the set point there is no flushing request signal generated, but when the pressure difference is higher, it will trigger a flushing cycle within 5 seconds.

Position No.	S3 (1-ON ; 0-OFF)	Set-point	
	1 2 3 4	Atm.	psi
00	0 0 0 0	The sensor is not active	
01	1 0 0 0	0.136	2
02	0 1 0 0	0.272	4
03	1 1 0 0	0.408	6
04	0 0 1 0	0.545	8
05	1 0 1 0	0.680	10
06	0 1 1 0	0.816	12
07	1 1 1 0	0.953	14
08	0 0 0 1	1.089	16
09	1 0 0 1	1.225	18
10	0 1 0 1	1.361	20
11	1 1 0 1	1.497	22
12	0 0 1 1	1.634	24
13	1 0 1 1	1.770	26
14	0 1 1 1	1.906	28
15	1 1 1 1	2.042	30

The function of the Jumpers JP1, JP7, JP8, JP9

JP1 – For calibration purposes only. During normal operation the upper pin of the jumper is free.

JP7 – For selection of the powering mode 6v or 12v.

JP8 – Enables or disables detection of "endless looping" problems. When the upper pin of the jumper is free, the detection is enabled.

JP9 – Immediate or delayed reaction to the DP signal. When the upper pin of the jumper is free, then the reaction to the flushing request signal of the

DP will trigger the next cycle after 5 seconds, otherwise it will be immediate.

Summary of the beeping sound indications

1 beep every 15 sec- normal operation

2 beeps every 15 sec- endless looping problem detected

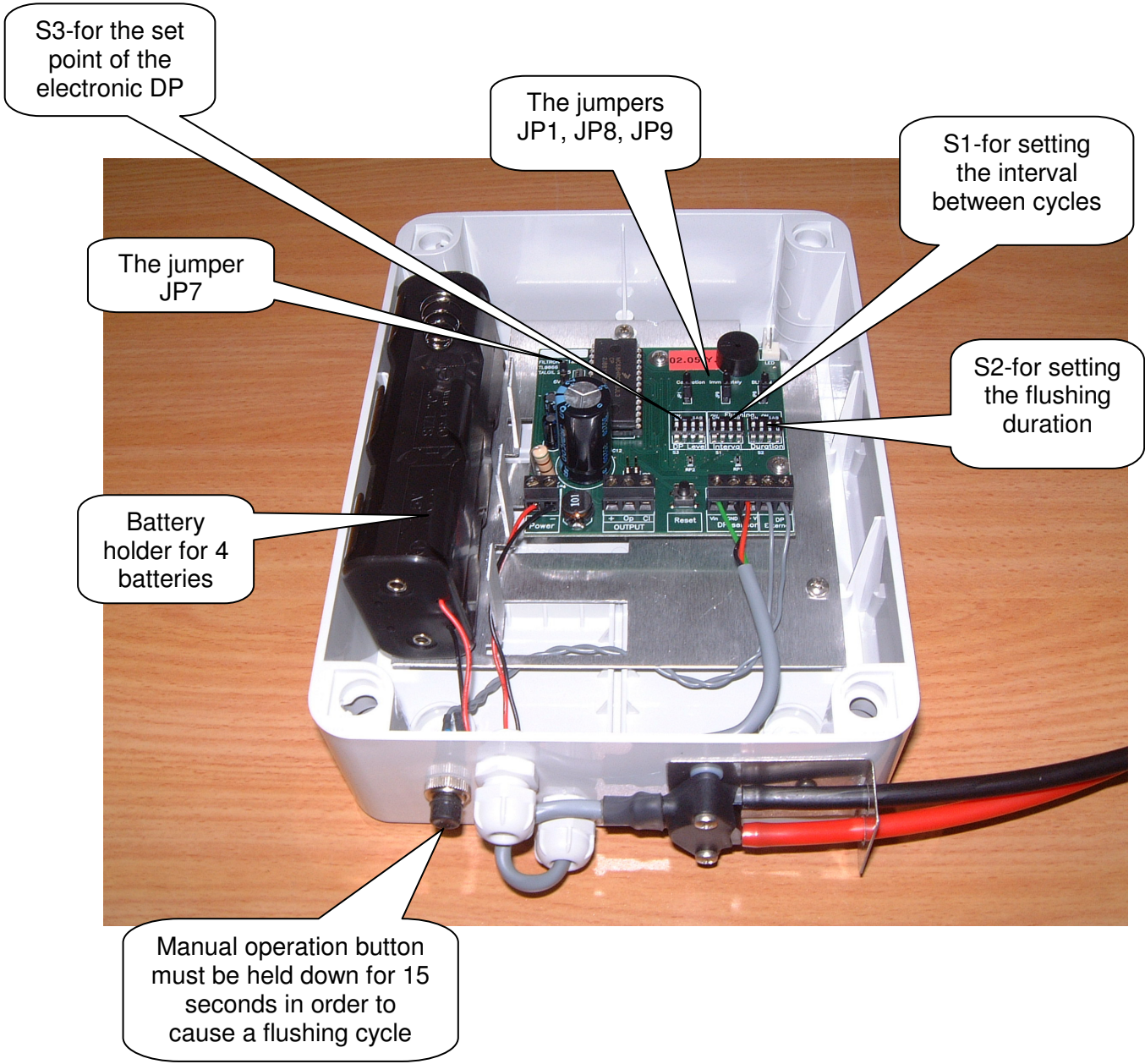**3 beeps every 15 sec-** low battery

6 beeps on power up or after RESET – indicates being in calibration mode.

Calibration

Calibration is required whenever the DP sensor is replaced. Prior to entering calibration mode the pressure difference sensed by the sensor must be zero, if necessary, disconnect the red and black command tubes from the system. Change the position of JP1 so that the right side pin remains free and push the RESET button. The 6 beeps will indicate the execution of the calibration process. Change the position of JP1 back to its normal position with the left side pin free, return the command tubes and push the RESET button again.
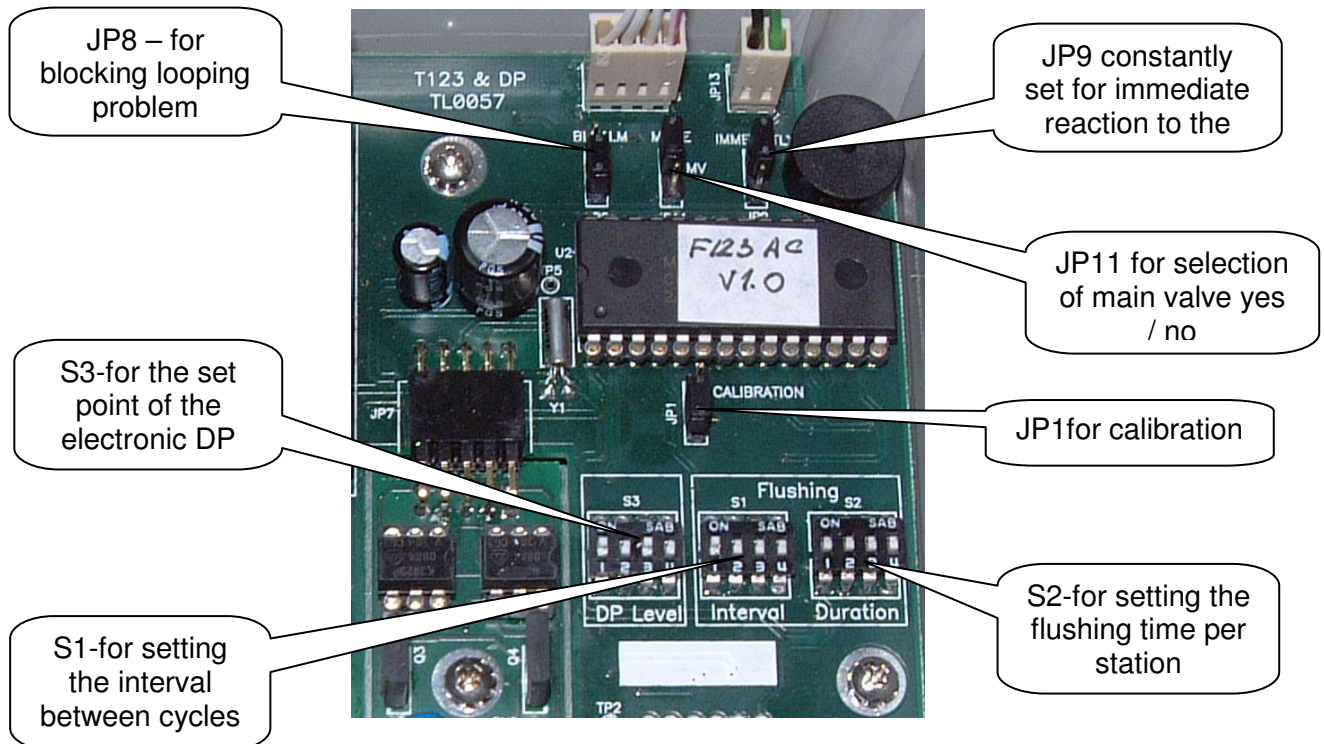
How to handle endless looping problems

The system will detect an "endless looping problem" after 7 consecutive flushing cycles. The problem can be recognized by the double beep sounded every 15 sec, and it means that the flushing request signal keeps arriving from the active DP sensor. In this case the system stops referring to the sensor and continues flushing based on the defined interval between cycles. The cause of the problem must first be detected and removed, and then push the RESET button to signal the controller that the problem was solved.

S3-for the set point of the electronic DP

The jumpers JP1, JP8, JP9

S1-for setting the interval between cycles

The jumper JP7

S2-for setting the flushing duration

Battery holder for 4 batteries

Manual operation button must be held down for 15 seconds in order to cause a flushing cycle

FILTRON 1/2/3+DP (AC)

- The "FILTRON 1/2/3+DP" is a controller for backwashing automatic filters of one, two or three stations.

- For accuracy and simplicity of use, the controller has been equipped with an electronic DP sensor (Differential Pressure sensor). Optionally a regular electromechanical DP can be used.

- The unit is equipped with a RESET button that when pushed generates a RESET signal and triggers a flushing cycle.

- The unit is equipped with two LED indicators, the green one indicates that the unit is energized and the red one indicates the operation statuses.

- Optionally a main valve can be controlled in place of the last station.

- Activates solenoids of 24v AC.

- Can be powered either by 110v AC or 220v AC.

- When working by DP, the system will detect problems of endless looping if after 7 consecutive cycles, the start of a new cycle is still requested by the DP sensor.

JP8 – for blocking looping problem

JP9 constantly set for immediate reaction to the

JP11 for selection of main valve yes / no

S3-for the set point of the electronic DP

JP1 for calibration

S1-for setting the interval between cycles

S2-for setting the flushing time per station

Setting the interval between cycles and the flushing time per station

Setting the interval between cycles and the flushing time per station is done through two blocks of dip switched S1, and S2. The following table summarizes the various possibilities:

1 – ON 0 - OFF	S1 1 2 3 4	meaning	1 – ON 0 - OFF	S2 1 2 3 4	meaning
	INTERVAL BETWEEN CYCLES			**FLUSHING TIME PER STATION**	
01	0 0 0 0	**DP only**	01	0 0 0 0	5 sec.
02	1 0 0 0	5 min.	02	1 0 0 0	6 sec.
03	0 1 0 0	10 min.	03	0 1 0 0	7 sec.
04	1 1 0 0	15 min.	04	1 1 0 0	8 sec.
05	0 0 1 0	20 min.	05	0 0 1 0	9 sec.
06	1 0 1 0	30 min.	06	1 0 1 0	10 sec.
07	0 1 1 0	45 min.	07	0 1 1 0	11 sec.
08	1 1 1 0	1 hour	08	1 1 1 0	12 sec.
09	0 0 0 1	2 hours	09	0 0 0 1	13 sec.
10	1 0 0 1	4 hours	10	1 0 0 1	15 sec.
11	0 1 0 1	8 hours	11	0 1 0 1	1.5 min.
12	1 1 0 1	12 hours	12	1 1 0 1	2 min.
13	0 0 1 1	18 hours	13	0 0 1 1	2.5 min.
14	1 0 1 1	24 hours	14	1 0 1 1	3 min.
15	0 1 1 1	72 hours	15	0 1 1 1	3.5 min.
16	1 1 1 1	120 hours	16	1 1 1 1	4 min.

Installing the electronic DP sensor

The DP sensor is equipped with 2 command tubes by which it should be connected to the filter. The red tube goes to the higher pressure (at the inlet), and the black tube to the lower pressure (at the outlet). It is important to put a small filter of 120 mesh between the red tube and the high pressure point.

Defining the set-point of the electronic DP sensor

The set point of the electronic DP sensor is defined by the dip switch block S3 as shown in the following table.

Position No.	S3 (1-ON ; 0-OFF) 1 2 3 4	Set-point	
		Atm.	psi
00	0 0 0 0	The sensor is not active	
01	1 0 0 0	0.1	2
02	0 1 0 0	0.3	4
03	1 1 0 0	0.4	6
04	0 0 1 0	0.5	8
05	1 0 1 0	0.7	10
06	0 1 1 0	0.8	12
07	1 1 1 0	1.0	14
08	0 0 0 1	1.1	16
09	1 0 0 1	1.2	18
10	0 1 0 1	1.4	20
11	1 1 0 1	1.5	22
12	0 0 1 1	1.6	24
13	1 0 1 1	1.8	26
14	0 1 1 1	1.9	28
15	1 1 1 1	2.0	30

How does an automatic backflush cycle occur ?

An automatic backflush cycle results of pressure difference between the inlet and outlet of the filter. When the pressure difference exceeds the set point for more than 15 seconds, a flushing request signal is generated. When using the electronic DP the actual reading is compared with the value selected by S3. When using an external DP the indication of excess pressure arrives in form of a closed contact at the "External DP" terminals.

The function of the Jumpers JP1, JP7, JP8, JP9

JP1 – For calibration purposes only. During normal operation the upper pin of the jumper is free.

JP8 – Enables or disables detection of "endless looping" problems. When the upper pin of the jumper is free, the detection is enabled.

JP9 - The jumper is constantly set for immediate reaction to the DP flushing request signal. The lower pin is free.

JP11 - Defines whether or not a main valve has to be controlled by the system. When the upper pin of the jumper is free, no main valve is defined.

Summary of the beeping sound indications

1 beep every 15 sec - normal operation

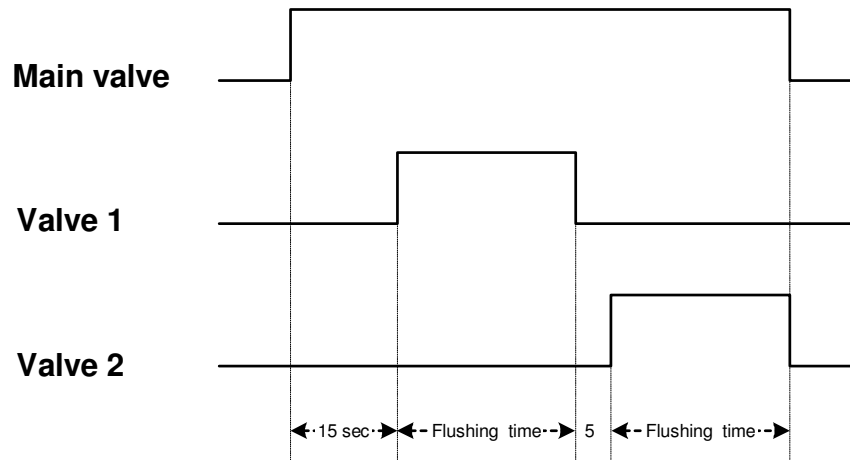**2 beeps every 15 sec -** endless looping problem detected

6 beeps on power up - indicates being in calibration mode. Usually this should not happen but when it does, it means that the position of JP1 has been set to calibration mode (lower pin free) the process must be completed as follows: make sure that the pressure difference sensed by the electronic DP is zero (if necessary, disconnect the red and black command tubes), and push the RESET button. Change the position of JP1 back to its normal position and push the RESET button again.

Endless looping problems

The problem of endless looping will be declared if after 7 consecutive flushing cycles the request signal for another cycle is still there. A consecutive flushing cycle happens when after termination of a previous flushing cycle (triggered by the DP) the flushing request signal still exists. However, if the flushing signal was removed, but for less than the stabilization time (T0=30 seconds) and then returned, another cycle will be triggered, which will be considered a consecutive cycle. If the stabilization time was completed without appearance of the DP signal, the counter of the consecutive cycles is cleared.

The problem is indicated by 2 beeps of the buzzer every 15 sec and by fast flushing of the red LED. When detecting "endless looping problem", the unit stops referring to the DP sensor and continues flushing by the defined interval only. The cause of the problem must first be detected and removed, and then the RESET button has to be pushed to signal the controller that the problem was solved.
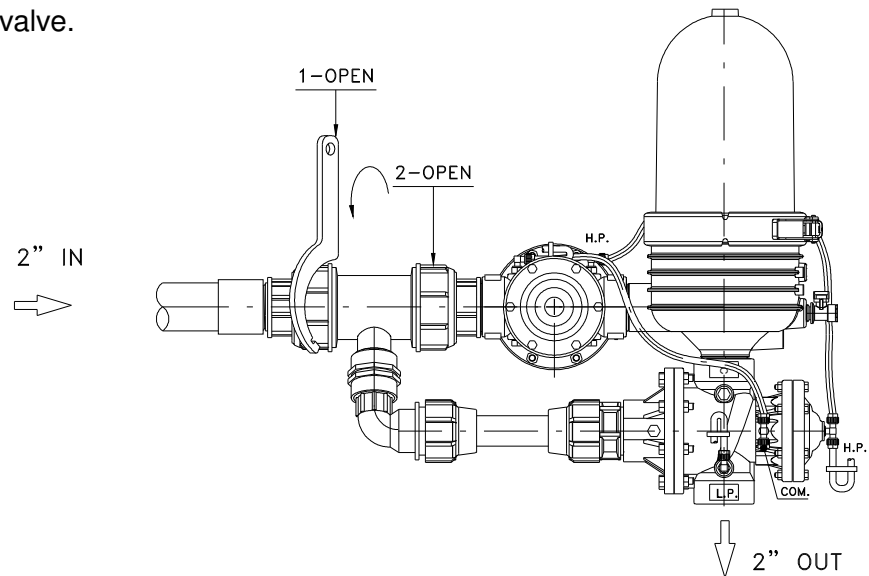
Timing Diagram

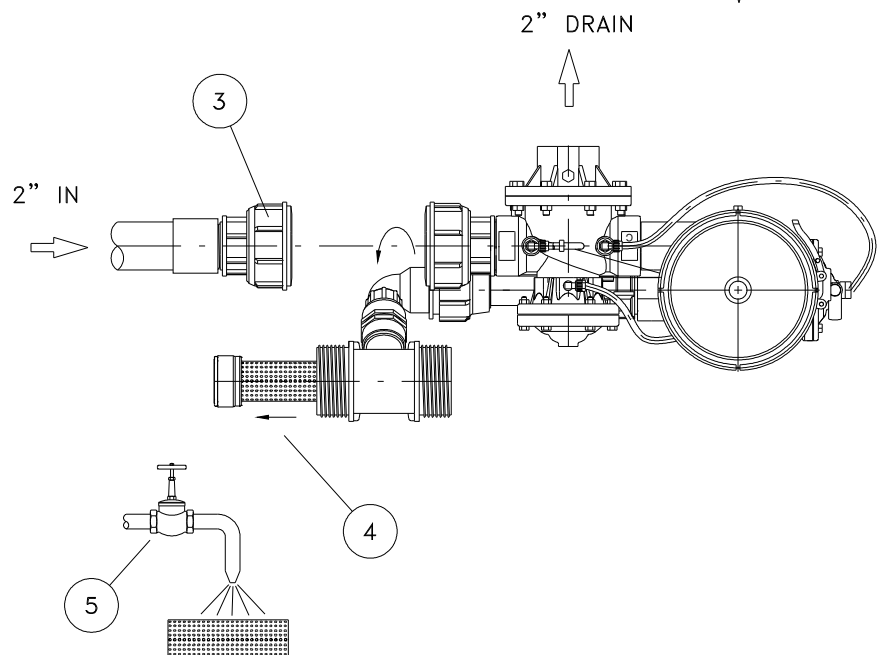| THE RED LED BEHAVIOR	THE MEANING
Constantly ON	Waiting between cycles
Blinking once in a second	Flushing in progress
Blinking fast	DP problem, waiting between cycles
3 blinks per second	DP problem, flushing by time in progress
Double blink	While changing positions of the switches
LED is OFF	Problem with the controller

Bypass Filter Maintenance

Instructions

1. Close the inlet water valve and release the pressure.

2. Use a wrench to release tightening nuts.

3. Unscrew the nut completely.

4. Twist the bypass filter.

5. Remove the internal screen element.

6. Rinse the screen element properly.

7. Reassemble in reverse order of above steps (5 thru 2).

8. Open the 2" inlet valve.

Figure 4: Bypass

Spin Klin – System Maintenance

Monthly Maintenance

Check inlet /outlet pressures

If the pressure differential is above 5 m / 7 PSI activate the backwash of the Spin Klin filtration system.

In the event that the pressure differential remains high check for possible failures.

Check for leakages from the drain manifold

If there is a leakage of water during the filtration stage, check for possible failure of the backwash valve seals.

Backwash controller performance

Check that the controller timing parameters are correctly set and activate the backwash cycle. In the event of possible failure of the backwash controller, please refer to chapter 8, troubleshooting

Winterization

In order to prevent the filter battery from becoming damaged under freezing conditions - drain all the water from the filter battery and leave the drain valve open.

Seasonal Maintenance - Cleaning the Discs

When manual cleaning of the discs is required, please follow the steps described below:

Make sure that system is not under pressure! Release the clamp and remove the cover. (Figure 1)
Unscrew the butterfly-nut on the filtration element. (Figure 2)
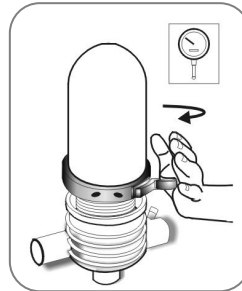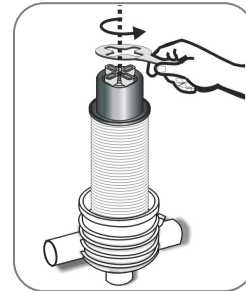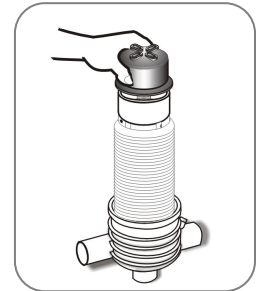Remove the tightening cylinder. (Figure 3)

Figure 1 **Figure 2** **Figure 3**

Remove the discs (for convenience we recommend using a plastic bag). (Figure 4, 5)
Tie each disc set on a string and place them in a cleaning solution (HCL, Chlorine, or other) refer to **"Cleaning Recommendations for Clogged Filtration Discs".**
Thoroughly wash the discs with fresh water and then reassemble the discs on the spines. (Figure 6)
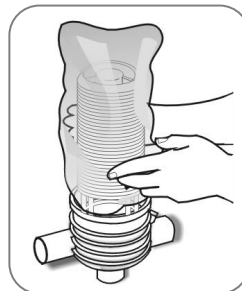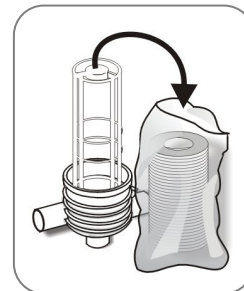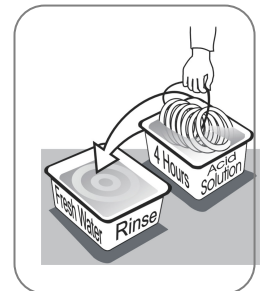
Figure 4 **Figure 5** **Figure 6**

Check that the correct quantity of discs is assembled on the spine: when the discs are pressed with two hands, the top disc should be level with the imprinted circle on the outside of the spine. (Figure 7)
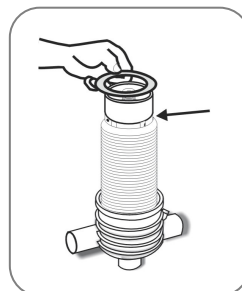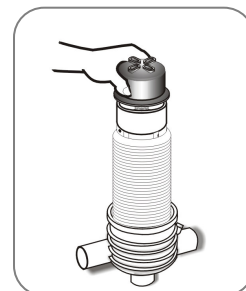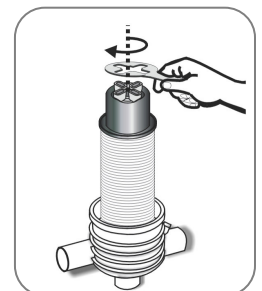Replace on the tightening cylinder and tighten the butterfly-nut, (Figure 8,9)

Figure 7 **Figure 8** **Figure 9**

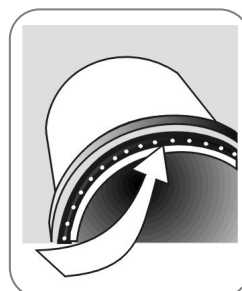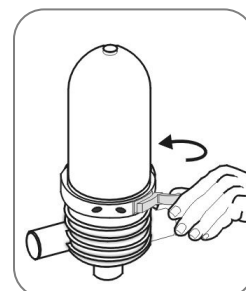Reassemble the filter cover and tighten the clamp. (Figure 10, 11)

Figure 10 **Figure 11**

Cleaning Recommendations for Clogged Filtration Discs

Water-formed deposits may cause clogging of the filter discs. The formation of these deposits depends on the quality of the filtered water and environmental conditions like temperature, pH, light, duration of filtration and more.

Common water-formed deposits are:

- Biological or organic deposits (mostly mucous or oily to the touch, beige, brown or green in color)
- Iron oxide (rust) or other metal oxides
- Carbonates (white or gray deposit)
- Combinations of the above

If these deposits cannot be eliminated by pretreatment of the water, we recommend the following cleaning procedure:

Material and Equipment

- A well ventilated working place.
- 2 small containers (1 liter), 2 large containers (15 liter) and a stirring stick, all resistant to chemicals, preferably of polypropylene.
- Plastic rope to tie up the disc.
- Sodium Hypochlorite NaOCl -
  Strong oxidizing liquid, commercial concentration: 10%.
  Oxidizes and removes organic and biological deposits.
- Hydrochloric Acid HCl -
  Very corrosive liquid, commercial concentration: 30%.
  Dissolves and removes carbonates, iron oxide, and other deposits.
- Safety equipment: safety glasses, gloves, long pants, long sleeved shirt and shoes.

Warning!

While working with chemicals protect yourself with the necessary safety equipment:

- Safety glasses, gloves, protective clothing.
- Work in a well-ventilated area.
- Follow the manufacturer's instructions.

Cleaning Organic and Biological Deposits

- Open the filter and remove dirty discs.

  Warning – Never open the filter before the pressure has been released.

- Arrange the discs loosely on the plastic rope.

- Prepare a 5% Sodium Hypochlorite solution:

  1) Pour 5 liters of water into one of the large containers.

  2) Add 5 liters of (10%) Sodium Hypochlorite into the water.

- Soak the discs in the solution so that both sides are covered. To achieve maximum cleaning, agitate the discs several times with a stirring stick.

- Contact time with cleaning solution: up to 8 hours.

- Remove the discs carefully from the solution, put them in the second large container and rinse them very well with clean water before placing them back in the filter.

- We recommend flushing the cleaned discs again in the filter to ensure that all chemical residues are removed.

The cleaning solution can be used for several sets of discs. As the cleaning activity of the solution deteriorates, it may be necessary to soak the discs for a longer time.

Cleaning Carbonates and Iron Deposits

- Open the filter and remove the dirty discs.

- Arrange the discs loosely on the plastic rope.

- Prepare a 5% Solution of Hydrochloric Acid:

  1) Pour 10 liters of water into one of the large containers.

  2) Carefully add 2 liters of (30%) Hydrochloric Acid into the water.

  Soak the discs in the solution so that both sides will be covered.

  PLEASE NOTE: Carbonates react violently with hydrochloric acid (foaming, gas evolution).

  To achieve maximum cleaning, agitate the discs several times with a stirring stick.

- Contact time with cleaning solution: 1 - 8 hours.

- Remove the discs carefully from the solution and rinse them well with clean water before placing them back in the filter.

- We recommend flushing the cleaned discs again in the filter to ensure that all chemical residues are removed.

The cleaning solution can be used for several sets of discs. It may be necessary to soak the discs for a longer period of time as the cleaning activity of the solution deteriorates.

Cleaning Complex Deposits

If the composition of the deposit is not known, perform the following test:

- Take 5 discs for the test.
- Soak 2 discs in a 5% Sodium Hypochlorite Solution.

  Preparation of the solution:

  Pour 1 cup of water into a small container, then add 1 cup of (10% NaOCl) Sodium Hypochlorite.

- Soak 2 discs in a 5% Hydrochloric Acid Solution.

  Preparation of the solution:

  Pour 2½ cups (= 500ml) of water into a small container, then add carefully ½ cup (= 100ml) of Hydrochloric Acid (30% HCl).

- Keep one disc as a control.
- Observe the cleaning process:

  If one of the solutions removes all of the deposit, clean the discs in that solution according to the instructions above.

  If neither solution removes the deposit completely, continue with the test procedure.

- Remove the discs from both solutions, rinse them well with water and soak them in the second solution: put the two discs, which have been in the Sodium Hypochlorite Solution, in the Hydrochloric Acid Solution, and the other way round.

- Check the cleaning process:

  If one of the treatments removes all of the deposit, clean all of the discs following the same two-step procedure in the exact same order. Rinse the discs well between the two cleaning processes.

  If the deposits haven't been completely removed, send a set of untreated discs to the laboratory for further examination.

Spare Parts

ITEM NO.	DESCRIPTION	PART NUMBER	QTY.
1	2" SK BODY BSPT+ 1l2" TRHEAD	2200 2205	1
2	2"-3" FILTER COVER W\O STOPE	2501 0210	1
3	2" COVER SEAL EPDM	5005 0002	1
4	2"-3" ARKAL CLAMP	5042 0030	1
5	2" SK FILTER ELEMENT	2123 1___	1
6	BERMAD 2x2 PL VALVE STRAIGHT FLOW	5062 0224	2
7	BYPASS FILTER 2inch	1899 0051	1
8	1 1/4x1 1/4 ADAPTOR	5022 5011	1
9	2x40 M_CONNECT	5022 5042	1
10	1 1/4x40 M. ANGLE	5022 3041	1
11	40mm PE CONNECT PIPE 265mm	2253 2265	1
12	T 8x1l8''x8	5078 0026	2
13	1/4 FINGER FILTER	5052 0002	2
14	8x1 /8 TEFEN ANGLE	5078 0034	3
15	VALVE 1/2x1/4	5054 0212	1
16	DOUBLE NIPPLE 1l4 TEFEN	5078 0064	2
17	1/8x1/8 TEFEN REDUS	5078 0066	2
18	GAUGE STOPER 3mm HOL	2511 0103	2
19	GAUGE PORT SEAL	5006 0004	2
20	8x1 /4 TEFEN ANGLE	5078 0036	1
21	SPACER	2253 4197	2

PROJECT:
TITLE: 2" S.K. FILTERS BATTERY

ARKAL
ARKAL FILTRATION SYSTEM
BET-ZERA 15135
TEL. 972-4-6775140
FAX. 972-4-6775461
ISRAEL

PAGE _1_ of _1_
CATALOGUE No: 1562M0201A1
FILE CODE 1562M0201A1
NAME IRINA DATE 15.03.07
FILE CODE DRAWING OF MANIFOLD; BACKUP:
DISK-1
DRAWER N:

DRAWN ארגל 15.03.07
CHECKED 15.03.07
APPROVED 15.03.07

REF 740
REF 615
240±2
REF 287
210±2
562±5
60
IN
OUT
DRAIN

ARKAL 2" S.K. FILTER

Cat. No: 1225 0___ THREADED CONNECTION
Cat. No: 1225 1___ VICTAULIC OUT CONNECTION

PARTS LIST

No:	CAT. No:	DESCRIPTION	MATERIALS
1.	2501 0220	FILTER COVER	R.P.A.
	2501 9220	TRASPARENT COVER	P.C.
2.	5005 0002	HYDRAULIC SEAL	EPDM
3.	5042 0030	CLAMP	S.S.
4.	2199 1002	SPINE COMPLETE	
4.1	2506 0224	"BUTTERFLY" NUT	R.P.A.
4.2	2506 0226	TIGHTENING CYLINDER	R.P.A.
4.3	2530 0216	PISTON	R.P.A.
4.4	2253 1225	SLIDING WASHER	P.E.
4.5	2022 1___	DISCS SET	P.P.
4.6	5076 0009	ABRASION SHIELD	S.S.
4.7	5006 0008	CONE MEMBRANE	N.R.
5.	2234 0324	COMPLETE ADAPTER	
5.1	5003 2234	"O" RING 2-234	EPDM
5.2	2503 0324	SPINE ADAPTER	R.P.P.
5.3	5003 2237	"O" RING 2-237	EPDM
6.	2224 0252	2" S.K. BODY THREADED OUT COMPLETE	
	2224 0253	2" S.K. BODY VICTAULIC OUT COMPLETE	
6.1	2500 0252	2" S.K. BODY THREADED OUT	R.P.A.
6.2	2500 0253	2" S.K. BODY VICTAULIC OUT	R.P.A.
7.	5076 0028	BUTTERFLY NUT WRENCH	G.S.

MATERIALS:

R.P.P. - REINFORCED POLYPROPYLENE
R.P.A. - REINFORCED POLYAMIDE
P.P.   - POLYPROPYLENE
S.S.   - STAINLESS STEEL
N.R.   - NATURAL RUBBER
G.S.   - GALVANIZED STEEL
P.C.   - POLYCARBONATE
P.E.   - POLYETHYLENE