

Odismatic[®] Hydraulic Filter CE

Series 851D

Operator's Manual

Models

851D15 (1½")

851D02 (2")

851D03 (3")

851D04 (4")

851D04L (4")

851D06 (6")

851D08 (8")



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ODIS takes all possible precautions in packing each equipment item to prevent damage during shipment. Carefully inspect each item, and if damage occurred, please report ODIS immediately.

TECHNICAL SPECIFICATION

General Data

Min. Working Pressure	2 bar	30 psi
Max. Working Pressure	10 bar	150 psi

For other working pressure consult **ODIS** representative.

SCREEN AREA AND RECOMMENDED FLOW RATES

MODEL	Inlet/Outlet diameter	Max. Flow rate		Flushing* Flow rate		Screen Area	
		m ³ /h	gpm	m ³ /h	gpm	cm ²	Inch ²
851D15	1½"	15	66	4-5	17-22	850	130
851D02	2"	25	110	4-5	17-22	850	130
851D03	3"	40	170	4-5	17-22	1450	225
851D04	4"	80	350	4-5	17-22	1450	225
851D04L	4"	80	350	8-10	35-44	2360	365
851D06	6"	150	660	8-10	35-44	4500	700
851D08	8"	300	1300	12-14	53-62	6200	960

Duration of flushing for 1½", 2", 3" and 4" models: 8-12 seconds.

Duration of flushing for 851D04L, 6", 8" models: 14-16 seconds.

The max. flow rate refers to screens over 200 microns/less than 80 mesh
For a finer filtration degree consults our representative.

SCREEN GRADES*

Mesh	500	300	200	150	120	100	80	50	40
Micron	30	50	80	100	120	150	200	300	400

* Other screens are available.

CONTROL SYSTEM

The control system consists of a DC flushing controller, a built-in differential pressure switch and a solenoid valve. The differential pressure switch is pre-adjusted.

MATERIAL

Filter housing: Carbon Steel, electrostatic powder coating
 Optional: Stainless Steel.

Filtration Screens: Sintered multi-layer screen.
 Weave wire mesh - P.V.C supported

Gaskets: Natural Rubber
 Optional: other material

CONSTRUCTION

The standard housing of the filter is made of carbon steel with a 120 micron protective coating of extra durable polyester, applied electrostatically and oven cured on a zinc-phosphate layer, for maximal anti-corrosion protection both internally and externally.

The unique design of the flushing chamber enables easy maintenance. Access to the internal parts of the filter is through the removable bolted cover.

All immersed parts are made of either plastic materials or non-corrosive metals to ensure many years of trouble free operation.

Optional materials for special applications are available. Please contact *ODIS* representative.

On top of the filter a hydraulic piston is mounted. The piston performs a longitudinal movement of the collector assembly with the suction nozzles, in order to clean the screen on all its length.

Simultaneously the hydraulic motor rotates the collector assembly with the suction nozzles to clean the screen on its entire perimeter.

The two motions guarantee that the suction nozzles will cover the whole screen surface and the cleaning process will be effective.

NOTE

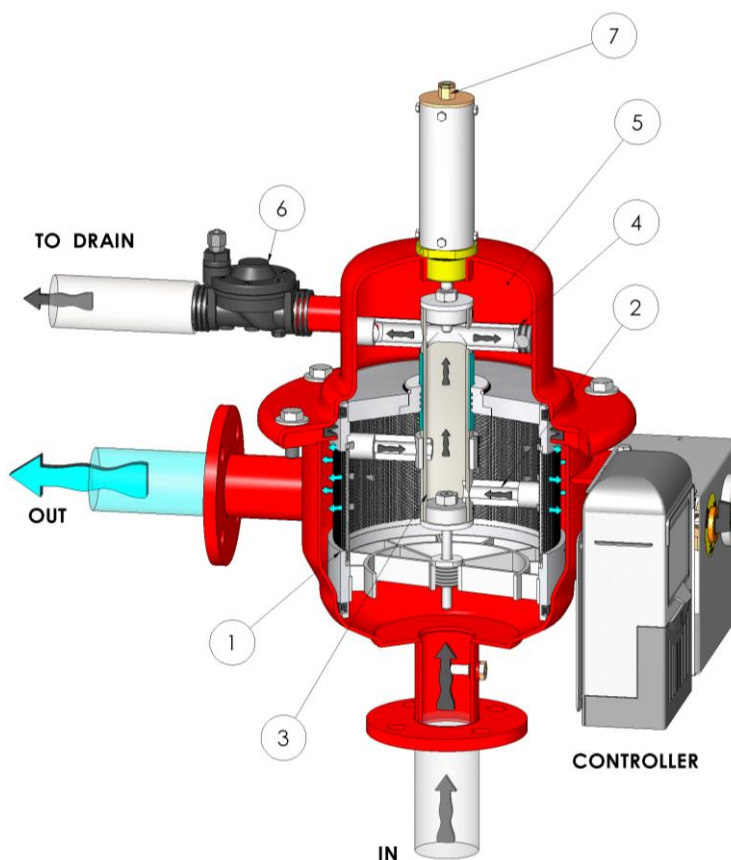
The DC models are equipped with pressure switch for saving batteries power when the filter is not in operation (the controller will not operate). The pressure switch disconnects the power supply from the batteries to the controller when there is no pressure at the filter's inlet.

OPERATING PRINCIPLES

A. NORMAL FLOW PATTERN

Raw water enters the filter through the inlet port, passing through the fine screen (1) and out to the outlet port. The sediments stopped on the screen (1) create a "cake" of sediment. This "cake" improves filtration efficiency as it performs a finer filtration. The sediments accumulated on the screen, create a differential pressure across the screen. The differential pressure rises until the predetermined value is reached [normally 0.5 bar (7.5 psi)].

A pressure switch gauge will activate the self cleaning process. A timer backup guarantees that the time passed from the last self cleaning process will not be longer than the preset value determined by the user.



B. SELF CLEANING

On a flushing command, the flushing valve (6) opens to the atmosphere and creates pressure drop in the motor chamber (5), causing the dirt to be sucked in from the screen by the nozzles (2). This pressure drop also moves the piston (7) and the collector in a linear movement. In addition, the hydraulic motor (4) rotates the collector.

These two processes performed simultaneously create a spiral movement of the nozzles so they cover the whole screen surface, enabling complete and effective cleaning of the screen.

The entire process takes seconds (according to specific model), upon completion of the cleaning process the filter returns to its initial position.

This self cleaning flushing cycle can be initiated by DP switch, timer backup or manually.

INSTALLATION

- Install the filter only in vertical position.
- A pressure relief valve must be installed before the filtering installation if the pressure is not controlled effectively.
- Prevent back-pressure or reverse flow - install a mechanical non-return valve on the filter outlets.
- Ensure there is enough space around the filter for easy maintenance.
- Inlet and outlet are marked by an arrow.
- Connect a drain pipe to the flushing valve; pipe diameter should fit the valve diameter to prevent pressure loss.
- Check for leaks.

NOTE: Install isolation valves at inlet & outlet. These valves will enable to service the filter whenever needed, and in addition the outlet valve can be used to adjust the flow rate if needed.

FIRST COMMISSIONING AND START - UP

1. Check that there are no upstream pipeline restrictions.
2. Check that the filter is mounted properly, as indicated by the arrows.
3. Check that the flushing valve is mounted properly.
4. Check that the tubing connections are completed.
5. Check that the flushing valve drain pipe is connected.
6. Check that the upstream and downstream isolation valves are closed.
7. Install batteries in the controller when using a DC controller.

NOTE: The differential pressure switch and timer have been preset to the proper settings. Do not adjust prior to start-up.

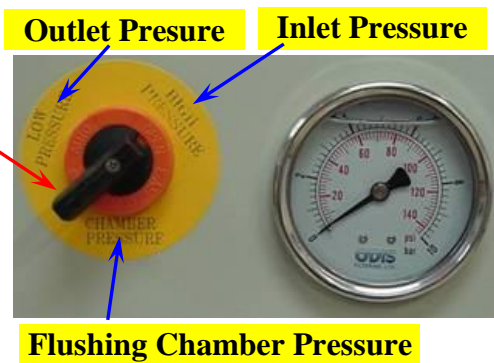
START - UP

1. Slowly open the inlet valve to the filter allowing the filter to pressurize.
2. Check for any leaks and eliminate.
3. Disconnect the control tube from the hydraulic piston and bleed it until all of the air is displaced by water. Reconnect the control tube.

4. Slowly open the outlet valve of the filter (if installed).

5. Initiate a manual flushing; observe the inlet and motor chamber pressures (use three way valve and manometer mounted on the control box). The motor chamber pressure should be between 0.8-1.5 bar below inlet pressure during the flushing cycle.

Minimum inlet pressure during flushing cycle should be 2 bar (30 psi) for all models.




6. Observe the differential pressure's build up across the filter. It is recommended to observe at least one full cycle to ensure that the system is operating properly.

MANUAL FLUSHING PROCEDURES

Periodically, it may be necessary to activate a manual flushing cycle of the filter. Some typical reasons are:

- Routine inspection of proper filter operation.
- Emergency cleaning of the filter.
- Troubleshooting /start up.

The manual flushing is activated by pressing the manual activation ("M" symbol)  on the controller by the display.

SHUT-DOWN & DRAINING PROCEDURES

NOTE: Before filter shut down or draining, perform two cycles of manual flush, verify that head loss on the filter does not exceed 0.1- 0.2 bar (1-2 meters).

SHUT DOWN PROCEDURE

1. Close the isolating valve on the outlet of the filter (if equipped).
2. Initiate a manual flushing as described in section 5.
3. Close the isolating valve at the inlet of the filter
4. Initiate an additional manual flushing cycle to relieve the pressure from the filter.

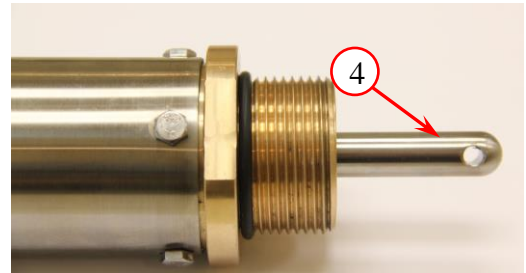
DRAINAGE PROCEDURE

Prior to accessing the filter internal parts, it is necessary to drain the filter. Note that uncontrolled emptying of the filter may result an excessive water spillage in the area around the filter.

MAINTENANCE

NOTE: In case that there is a need to drain the filter completely, perform manual flush before draining the filter.

- Repair damage to the protective coating of the filter immediately. Prior to applying the protective paint, clean the damaged spot thoroughly with a wire brush.
- Every three (3) months depressurize the filter; disconnect the command pipes from the piston. Dismantle the piston from the filter by unscrewing the piston out. Pull out piston rod (4) lubricate the piston rod with lubrication grease “DOW CORNING® 4DC or EQUAL. Push the piston rod back inside and install the piston back. Bleed the air from the command pipes until all the air is displaced by water, connect the command pipes back.

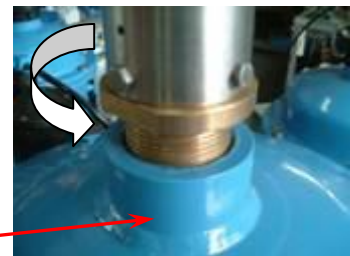


Warning: for lubrication use only “DOW CORNING® 4DC or EQUAL. Using other lubrication grease will damage piston’s rubber parts.

Piston lubrication

Every year lubricate the piston internal parts with lubrication grease “DOW CORNING® 4DC or EQUAL:

- Depressurize the filter and disconnect the command pipes from the piston.
- Dismantle the piston from the filter by unscrewing the piston out.



NOTE: Replace damaged seals and gaskets as necessary or every 3 years.

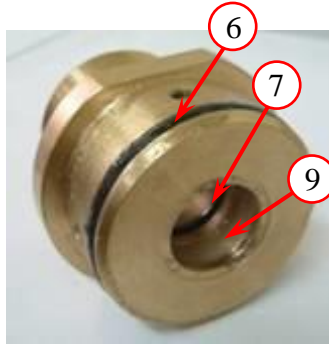
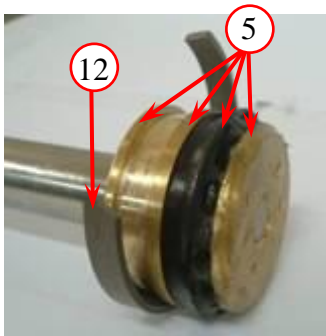
- Screw out the bolts (1), and pull the front flange (2) out.

NOTE: do not screw out the rear bolts (3)

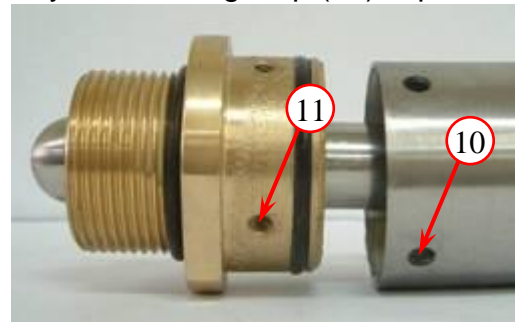
- Pull the piston bar with the whole assembly (4) out of the cylinder.



– Apply a thin layer of lubrication grease to following parts: (5), (6), (7) and (8).



- Fill the inner slot (9) with lubrication grease up to the slot edges.
- Slide the piston (4) assembly into the cylinder; verify that leading strip (12) is placed in its slot. Slide the front flange (2) on the piston bar (4).
- Align the screw holes on the cylinder (10) with the screw threads on the front flange (11).
- Screw the bolts (1), and gently tighten them.
- Install the piston on the filter, and connect the command pipes back to the “TEE” fitting.
- Check for water leakage during next operation and flushing process.



* Every 2 years Replace the following parts listed in the following table:

		Model		
Cat. No. for 2 years spare parts kit		851D15 (1½") 851D02 (2")	851D03 (3") 851D04 (4") 851D04L (4")	851D06 (6") 851D08 (8")
		ER851C-15	ER851C-3	ER851-6
No.	Description			
2	Cover gasket	E851001	E851001	ER10033
3/2	Screen Seal	E263003 (2 units)	E263003 (2 units)	E8628000 (2 units)
3/3	Upper Bearing	ER02075-ER	ER02075-ER	ER03077-ER
5	Bearing Stopper – "O" Ring	E863R005	E863R005	E863R005
7	Hydraulic piston seals & gaskets set	ER005	ER005	ER002
11	Lower Bearing	E8515414	E8515414	E8510619

Instruction for filters dismantling and installing

(Items no. refers to breakdown drawing D-851D-001-03)

- Disconnect command pipes from the piston (item no. 7).
- Unscrew cover bolts (item no. 9) and remove the cover (item no. 8).
- Take out the collector assembly (item no. 4) by holding the hydraulic motor (item no. 4/2) and a slightly pulling upwards.
- Pull out the screen (item no. 3 or 3A).
- For replacing lower bearing (item no. 11);
 - Separate the collector assembly (item no. 4) from the bearing base (item no. 10).
 - Unscrew the hydraulic motor locking bolt (item no.4/3) and pull out the hydraulic motor (item no.4/2) from the collector assembly (item no. 4)
 - Separate the bearing base (item no. 10) from the collector assembly.
 - Remove bearing stopper (item no. 5) and pull out the lower bearing (item no. 11).
 - Install the new lower bearing into its place in the bearing base (item no. 10) and secure it with the bearing stopper (item no. 5). Before installing the bearing stopper lubricate it with silicone grease "OKS 1110/0" or equivalent grease.
 - Install the bearing base (item no. 10) on the collector assembly (item no. 4), install back the hydraulic motor (item no.4/2) and secure it with the locking bolt (item no.4/3).
- For replacing upper bearing (item no. 3/3);
 - Take out the screen assembly (item no. 3 or 3A).
 - The upper bearing is installed inside the fine screen handle (item no.3/4). Press on the upper bearing from outside (item no.3/3) to pull it out.
 - Insert the new bearing (item no. 3/3) into the fine screen handle (item no.3/4) from the inside and press it until it fits in place.
- Verify that the screen seals (items no. 3/2) are intact (or replace if necessary), lubricate the seals with silicone grease "OKS 1110/0" or equivalent grease.
- Insert the screen (item no. 3 or 3A) assembled with the collector assembly (item no. 4) into the filter body and press slightly the bearing base (item no. 10) to fit in place.
- Verify that the cover seal (item no. 2) is intact (or replace if necessary), lubricate the seal with silicone grease "OKS 1110/0" or equivalent grease and place it in its groove in the filter body.
- Place cover (item no. 8), screw in cover bolts (item no. 9) and tighten the bolts.
- Connect command pipes back to the piston (item no. 7).
- Perform start up procedure and manual flush to the filter.

Instruction for cleaning the screen

It is recommended to take out the filter screen for cleaning and checking every one year / on completion of irrigation / when head-loss does not decrease after three repetitive flushing cycles due to differential pressure switch.

- Gently clean the screen using a bristle brush.

NOTE: If a bristle brush does not remove particles from screen, immerse screens in an acid/alkaline solution for some time, then rinse it thoroughly. Recommended solution: 1% - 2% Hydrochloric Acid (HCl), or 5% Sodium Hydroxide (NaOH).

WARNING: Chemicals manufacturer's safety instructions should be read use.

WINTERIZING YOUR FILTER

When the filter remains inactive and there is a risk of freezing weather, it is strongly recommended to take precautions to protect your filter and components from freezing damages.



ATTENTION: The remaining water in the components can freeze, expand and crack/damage internal parts and pipes.

NOTE: Before filter shut down or draining, perform two cycles of manual flush, verify that head loss on the filter does not exceed 0.1-0.2 bar.

Winterization Instructions

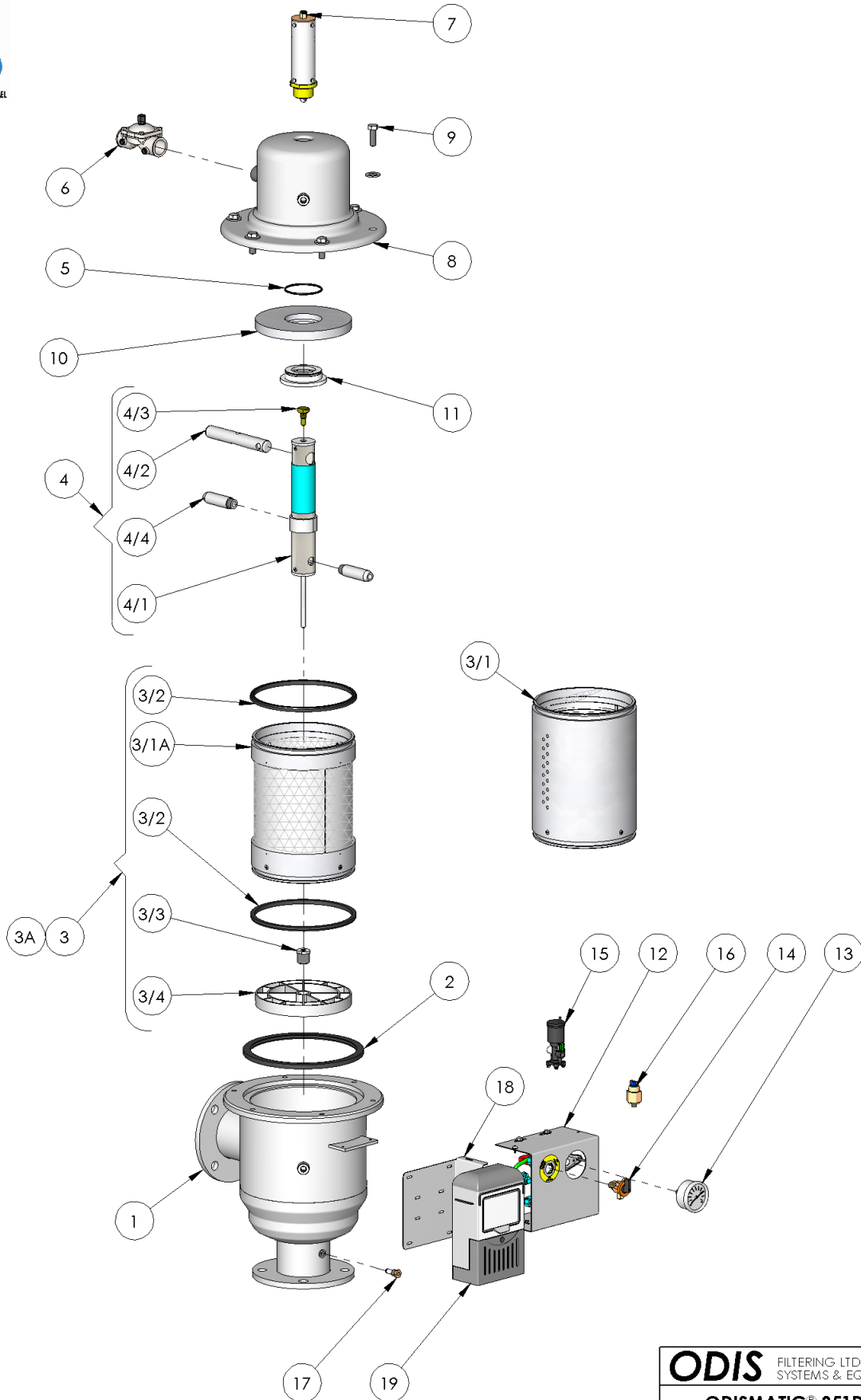
1. Close the isolating valve on the outlet of the filter (if equipped)/prevent downstream water from penetrating the filter.
2. Close the isolating valve at the inlet of the filter (if equipped)/shut down water supply to the filter.
3. Initiate manual flushing cycle to relieve the pressure from the filter.
4. Disconnect power supply to the controller; take out batteries/ on filters equipped with main power supply switch, turn off the switch.
5. On filters equipped with manual draining valves, open the valves.
6. Open all command pipes fittings, drain the water from the pipes and close all fittings back.
7. Flushing valves:
 - 7.1. Remove a plug or a control tube from the valve cover and drain water.
 - 7.2. Remove upstream and downstream plugs from the valve body to empty it.
8. Solenoid valves:
 - 8.1. Disconnect high pressure pipe and command pipe to valve and drain the water.
9. Filters equipped with piston:
 - 9.1. Disconnect the command pipes from the piston. Dismantle the piston from the filter.
 - 9.2. Lubricate the piston rod with lubrication grease "DOW CORNING® 4DC or EQUAL. Push the piston rod back inside and connect it back to the filter.
 - 9.3. Use compressed air to dry the command pipes.

OdisMatic® 851D (1½" - 8") Part List

(refer to drawing D-C851D-001-03 issue 0)

NO.	DESCRIPTION	MODELS				
		851D15 (1½")	851D02 (2")	851D03 (3")	851D04 (4")	851D04L (4")
1	Filter body	A851C15	A851C02	A851C03	A851C04	A851C04L
2	Cover gasket	E851001	E851001	E851001	E851001	E851001
3	Fine screen Ass. – (P.V.C)	E8510254	E8510254	E8510454	E8510454	E8510461
3-A	Fine screen Sintered – Ass.	E8510259	E8510259	E8510459	E8510459	E8510460
3/1	Fine screen – PVC body	E8510256	E8510256	E8510456	E8510456	E8510466
3/1-A	Fine screen Sintered	E8510255	E8510255	E8510455	E8510455	E8510465
3/2	Screen Seal	E263003	E263003	E263003	E263003	E263003
3/3	Upper Bearing	ER02075-ER	ER02075-ER	ER02075-ER	ER02075-ER	ER02075-ER
3/4	Fine screen handle	ER02093	ER02093	ER02093	ER02093	ER02093
4	Dirt collector – Assembly	E8510252	E8510252	E8510452	E8510452	E8510453
4/1	Dirt collector body	E8515216	E8515216	E8515416	E8515416	E8515417
4/2	Hydraulic motor	E8510258	E8510258	E8510258	E8510258	E8510458
4/3	Hydraulic motor locking bolt	E8510407-BR	E8510407-BR	E8510407-BR	E8510407-BR	E8510407-BR
4/4	Suction nozzle	ER8510402	ER8510402	ER8510402	ER8510402	ER8510402
5	Bearing Stopper – "O" Ring	E863R005	E863R005	E863R005	E863R005	E863R005
6	Flushing valve	NB40501502T	NB40501502T	NB40501502T	NB40501502T	NB40501502T
7	Hydraulic piston	E8515212	E8515212	E8515412	E8515412	E8515412
8	Cover	E8510260	E8510260	E8510471	E8510471	E8510471
9	Bolt	L2912102030U	L2912102030U	L2912102030U	L2912102030U	L2912102030U
10	Bearing base	E8515413	E8515413	E8515413	E8515413	E8515413
11	Lower Bearing	E8515414	E8515414	E8515414	E8515414	E8515414
12	Pressure control box	Y8510201-MG	Y8510201-MG	Y8510201-MG	Y8510201-MG	Y8510201-MG
13	Pressure gauge	N6111025	N6111025	N6111025	N6111025	N6111025
14	3 way valve selector	PM202500	PM202500	PM202500	PM202500	PM202500
15	Solenoid DC latch	N512026	N512026	N512026	N512026	N512026
16	Pressure switch - NC	N6628	N6628	N6628	N6628	N6628
17	Mini Control Filter	N511006	N511006	N511006	N511006	N511006
18	Pressure control box side cover	Y8510204-MG	Y8510204-MG	Y8510204-MG	Y8510204-MG	Y8510204-MG
19	DC Controller	N5312222	N5312222	N5312222	N5312222	N5312222

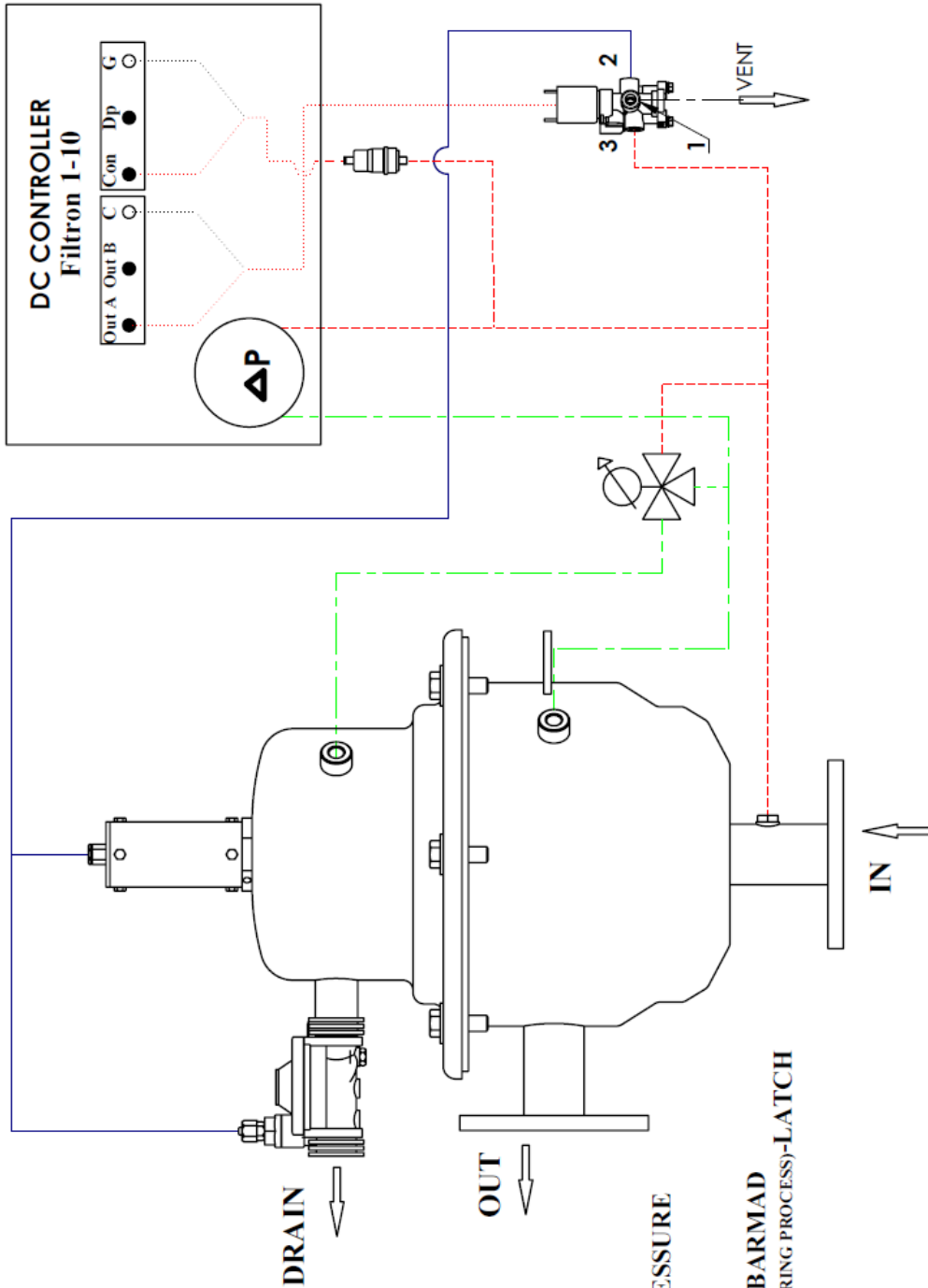
NO.	DESCRIPTION	MODELS	
		851D06 (6")	851D08 (8")
1	Filter body	A85106	A85108
2	Cover gasket	ER10033	ER10033
3	Fine screen Ass. – (P.V.C)	E8510604	E8510804
3-A	Fine screen Sintered – Ass.	E8510609	E8510817
3/1	Fine screen – PVC body	E8510606	E8510806
3/1-A	Fine screen Sintered	E8510616	E8510816
3/2	Screen Seal	E8628000	E8628000
3/3	Upper Bearing	ER03077-ER	ER03077-ER
3/4	Fine screen handle	ER10016-PL	ER10016-PL
4	Dirt collector – Assembly	E8510602	E8510815
4/1	Dirt collector body	E8510607	E8510807
4/2	Hydraulic motor	E8510614	E8510614
4/3	Hydraulic motor locking bolt	E8510407-BR	E8510407-BR
4/4	Suction nozzle	ER8510602	ER8510602
5	Bearing Stopper – "O" Ring	E863R005	E863R005
6	Flushing valve	NB40502001T	NB40502001T
7	Hydraulic piston	E8510612	E8510612
8	Cover	E8510630	E8510630
9	Bolt	L2912102030U	L2912102030U
10	Bearing base	E8510618	E8510618
11	Lower Bearing	E8510619	E8510619
12	Pressure control box	Y8510201-MG	Y8510201-MG
13	Pressure gauge	N6111025	N6111025
14	3 way valve selector	PM202500	PM202500
15	Solenoid DC latch	N512026	N512026
16	Pressure switch - NC	N6628	N6628
17	Mini Control Filter	N511006	N511006
18	Pressure control box side cover	Y8510204-MG	Y8510204-MG
19	DC Controller	N5312222	N5312222



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ODIS FILTERING LTD SYSTEMS & EQUIPMENT		
ODISMATIC® 851D PARTS BREAKDOWN		
DATE 27.10.14	DWG No. D-C851D-001-03	ISSUE 0

ODIS FILTERING LTD SYSTEMS & EQUIPMENT	
ODISMATIC® 851D CONTROL DIAGRAM	
DATE 12.02.13	DWG No. P13851C001A
	ISSUE 3



LEGEND

COMMAND LINE

ELECTRICAL LINE

HIGH PRESSURE LINE

LOW PRESSURE LINE

DIFFERENTIAL PRESSURE SWITCH(DP)

SOLENOID VALVE - BARMAD
(SHOWN OPEN DURING FILTERING PROCESS)-LATCH

PRESOSTAT

PRESSURE GAUGE

3 WAY VALVE

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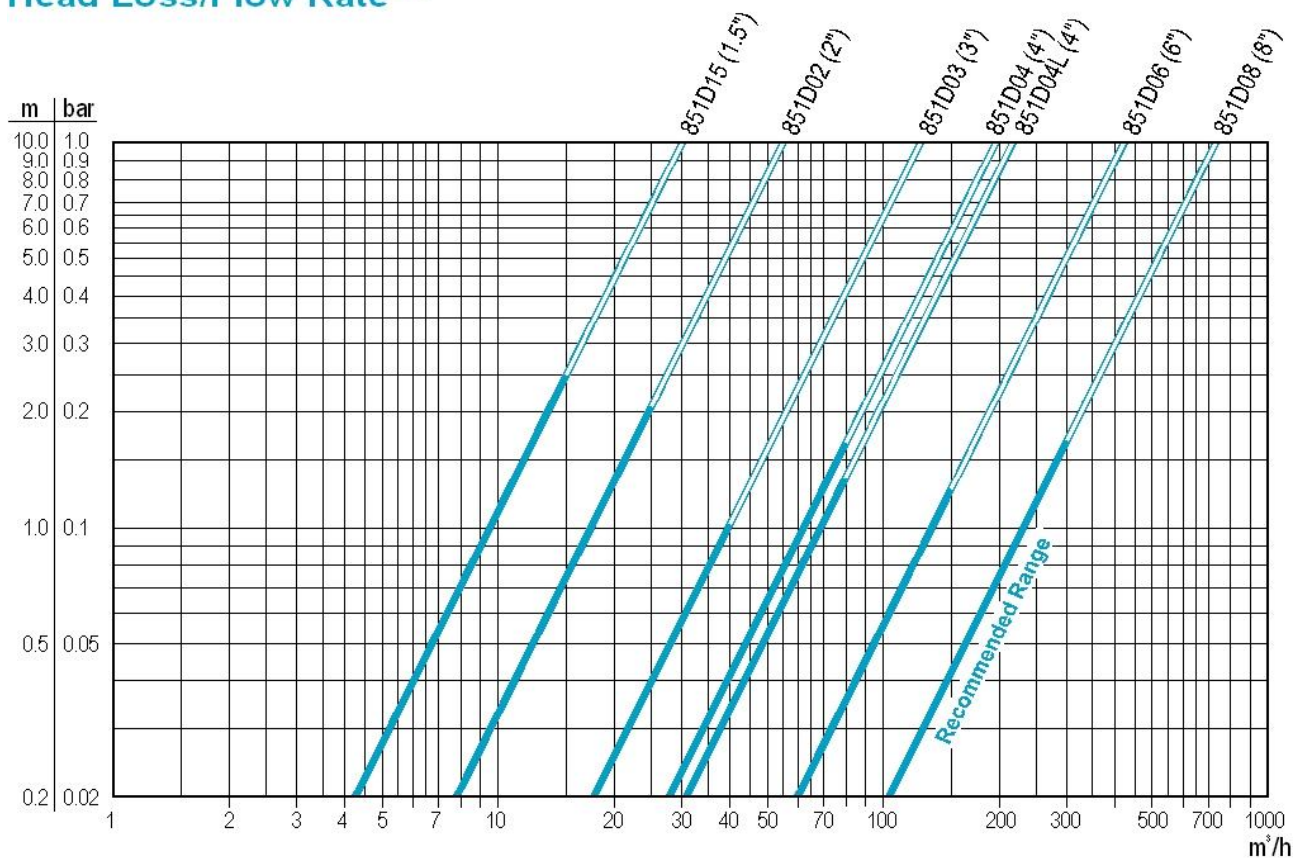
Head Loss / Flow Rate

Metric Units

Head Loss **

Model	Flow Rate Q (m ³ /h)													
	5	10	15	25	50	75	100	150	200	250	300	350	400	500
	Head Loss dP (bar)													
851D15		0.11	0.25	0.69										
851D02			0.07	0.21	0.83									
851D03					0.16	0.36	0.64							
851D04					0.07	0.15	0.26	0.59	1.04					
851D04L					0.05	0.11	0.19	0.43	0.76					
851D06							0.06	0.13	0.23	0.35	0.51	0.69	0.90	
851D08								0.04	0.08	0.12	0.17	0.23	0.30	0.47

Head Loss/Flow Rate **



** For a clean filter and 120 micron screen

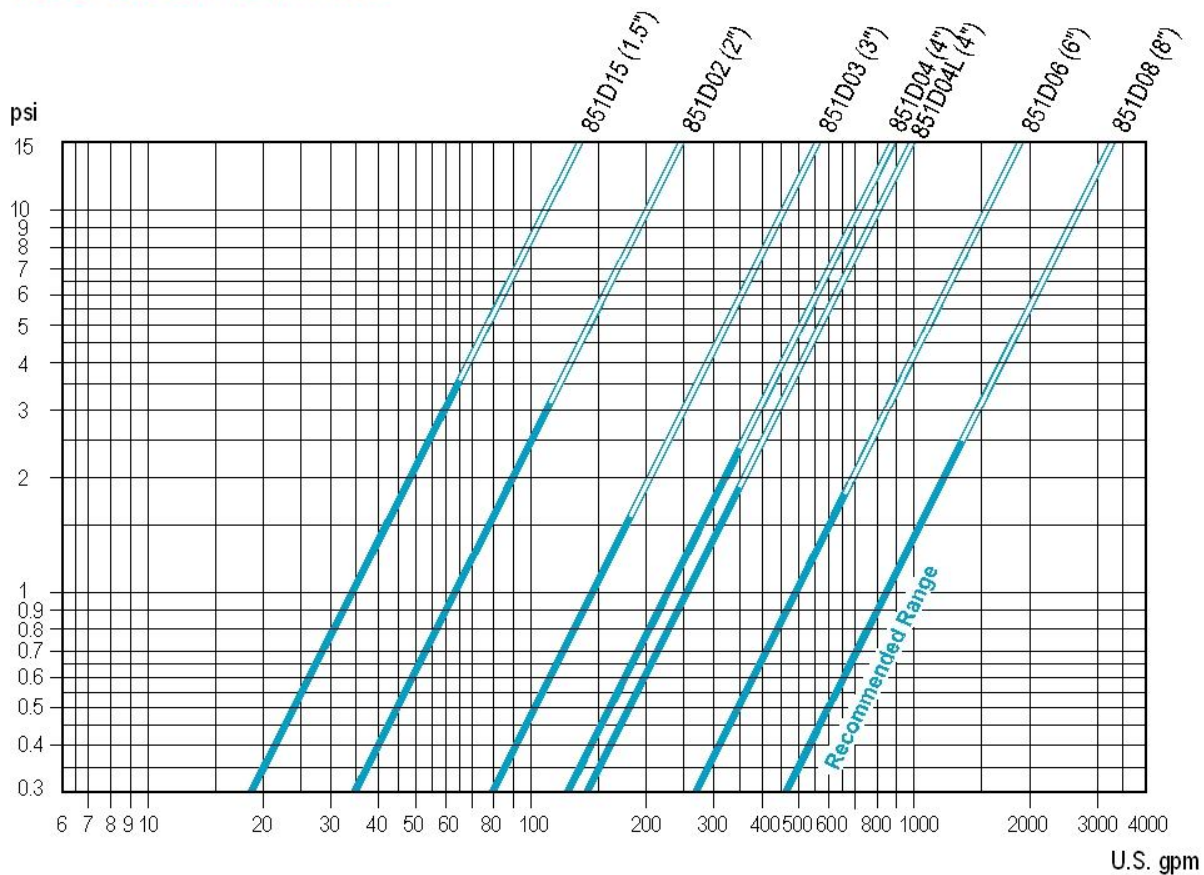
■ 1 bar=100 kPa=1.02 kg/cm²=10.2 m (W.C)=14.5 psi

U.S. Units

Head Loss **

Model	Flow Rate Q (U.S. gpm)													
	25	50	75	100	150	200	250	300	350	400	500	750	1000	1500
851D15	0.5	2.1	4.7	8.3	5.6									
851D02		0.6	1.4	2.5	1.1	9.9	15.5							
851D03						1.9	3.0	4.3	5.9	7.7	12.0			
851D04						0.8	1.2	1.8	2.4	3.1	4.9	11.0		
851D04L						0.6	0.9	1.3	1.7	2.3	3.6	8.0		
851D06									0.5	0.7	1.0	2.4	4.2	9.4
851D08												0.8	1.4	3.2

Head Loss/Flow Rate **

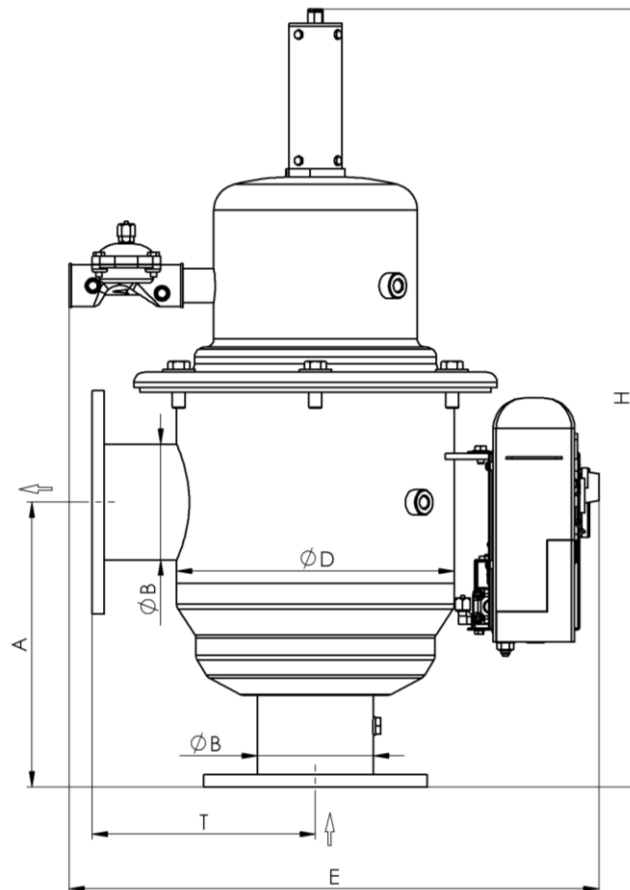


** For a clean filter and 120 mesh screen
 ■ 1 psi=0.069 bar=6.9 kPa=0.07 kg/cm²=0.7 m (W.C)

Dimensions & Weight

Model	B	D	A *		E *		H *		T *		Weight	
	inch	inch	mm	inch	mm	inch	mm	inch	mm	inch	Kg	lbs
851D15M	1½	10	188	7.4	540	21	560	22	175	6.9	25	55
851D15F	1½	10	230	9.1	540	21	600	24	220	8.7	26	57
851D02M	2	10	196	7.7	540	21	570	23	185	7.3	27	60
851D02F	2	10	230	9.1	540	21	600	24	220	8.7	28	62
851D03M	3	10	260	10.2	540	21	750	30	195	7.7	40	88
851D03F	3	10	280	11	540	21	770	31	220	8.7	41	90
851D04F	4	10	280	11	540	21	770	31	220	8.7	42	92
851D04LF	4	10	280	11	540	21	905	36	220	8.7	48	106
851D06F	6	12	540	21.2	600	24	1310	52	320	12.6	65	143
851D08F	8	12	700	27.6	600	24	1530	60	320	12.6	78	172

* For Victaulic connection decrease 5 mm from F model.



Models

- 851D15, 851D02
- 851D03, 851D04, 851D04L
- 851D06, 851D08

Odismatic® (Electric or Hydraulic Filter)

WARRANTY

1. **During a period of Four (4) years** (“the Warranty Period”) which commences on the delivery date (F.O.B. – Israeli Port) - or up to two (2) years commences on the installation date, but in any case not more than the warranty period mentioned above, and subject to the provisions of this warranty, Odis shall remedy in the manner described below any defect in the equipment which results directly from Odis faulty materials or workmanship.
2. During the Warranty Period, Odis shall repair or replace any part of the Equipment found to be defective in manufacture, or, at its option, refund the portion of the purchase price attributable thereto. Such repair, replacement or refund is purchaser’s sole and exclusive remedy for defective Equipment. Without derogating from the generality of the foregoing, Odis liability shall be limited to the cost of materials and labor required for the repair or replacement or refund of the defective part.
3. Purchaser must notify Odis in writing of the claimed defect, including a detailed description of the defect. Such notice shall be submitted to Odis promptly and without any delay after the discovery of the defect.
4. Purchaser shall not attempt any repair or replacement of the Equipment other than in cases of emergency. In no case shall Odis be liable for the cost of such repairs or replacement carried out by the Purchaser.
5. Odis shall have no responsibility for defects in the Equipment to the extent caused by use other than as stated in Odis’ Operating Manual, misuse, abuse, or installation, maintenance, operation or repairs by the purchaser or by persons not under the supervision of Odis.
6. When a defect in a part of the Equipment has been remedied, the repaired or replaced parts shall be deemed to be part of the Equipment and Odis shall be liable for defects therein until the end of the Warranty Period. Any defective part which is replaced by Odis shall thereupon become Odis’ sole property.
7. Odis liability to defects in components of the Equipment which are not manufactured by Odis (including, but not limited to, computers, electrical boards, gaskets, gauges, valves, flow and turbidity meters) is limited to defects which results directly from faulty materials or workmanship, that are discovered within a period of 1 (one) year from the installation date, but in any case not more than the warranty period mentioned above.
8. The foregoing warranty is in lieu of all other warranties, expressed or implied, including, but not limited to any implied warranties of merchantability or fitness for a particular purpose.
9. In no event shall Odis be liable for any other damages whatsoever (including, without limitation damages for loss of business profit, business interruption, or other pecuniary loss) arising out of the use of or inability to use the equipment, even if Odis has been advised of the possibility of such damages .
10. In any case, Odis entire liability under any provision of this warranty shall be limited to the amount actually paid by the purchaser for the equipment .

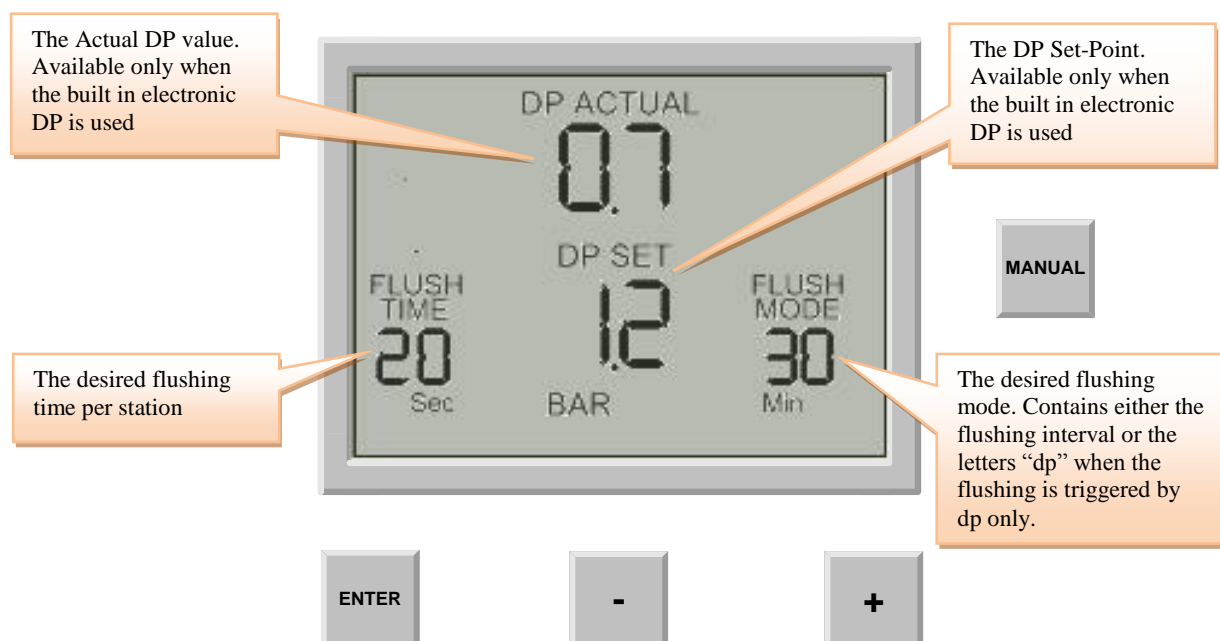
FILTRON 1-10 DC – USER'S MANUAL (2011)

List of features

- The “FILTRON 1-10” is a modular backflushing controller for automatic filters of 1 to 10 stations.
- 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 charge pump.
- 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.

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 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.

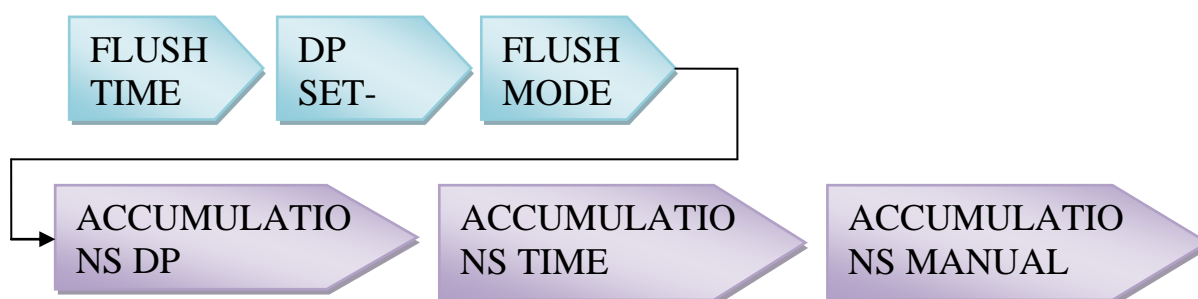
Pushing the ENTER key again will set the selected value to the current field and move the focus to the next editable field which will start blinking. Once entering this process of passing through the editable fields, the user has no way back but by pushing the ENTER key repeatedly, he passes through 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.

REMAR

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.



The Flush Time

Defines the duration of 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

The 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.

The Flush Mode

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

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.



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.

The 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.

The 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.

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  manual operations key.

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 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

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.

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.



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.

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.

TECHNICAL DATA

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.

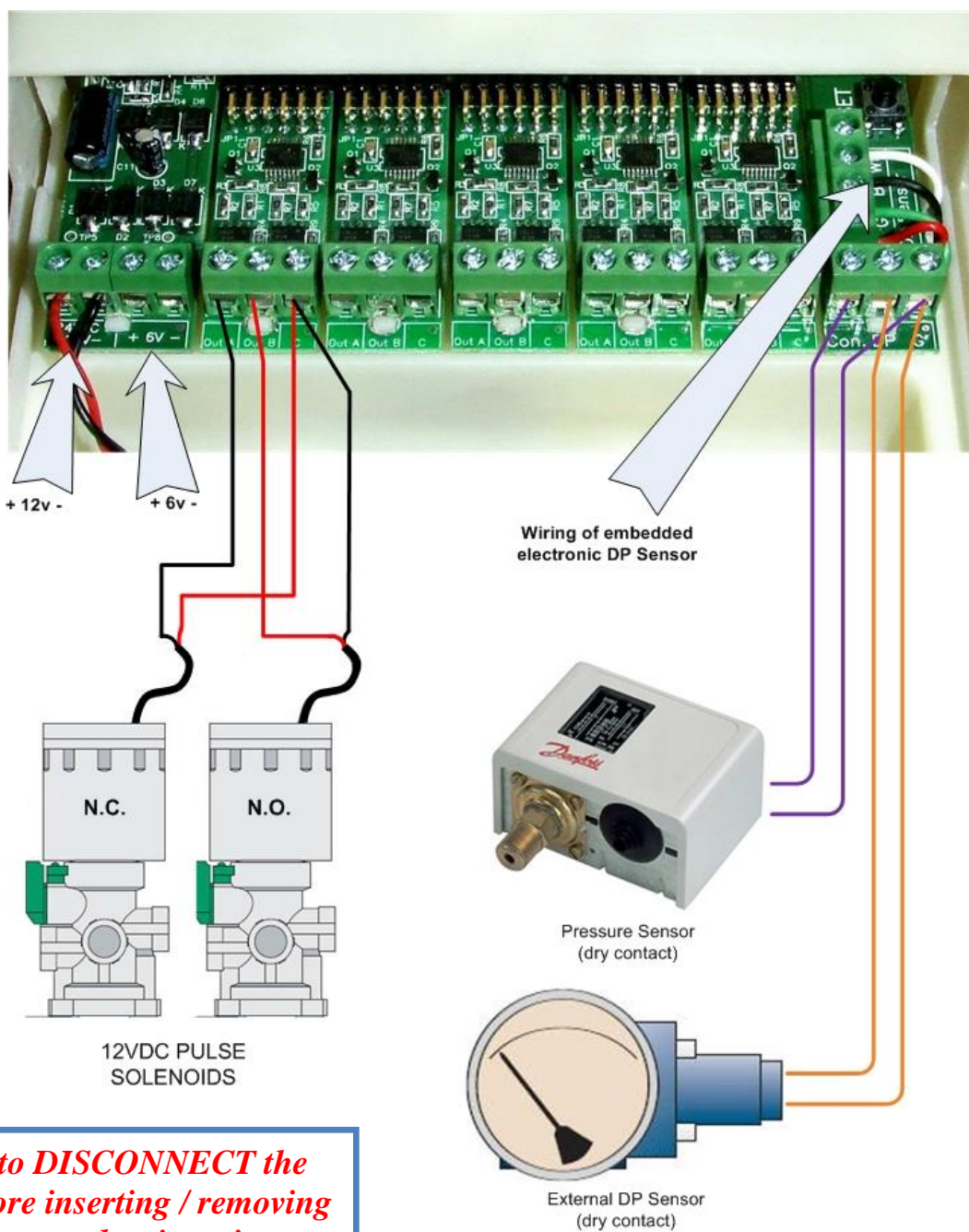
Wiring Diagram

DC MODEL

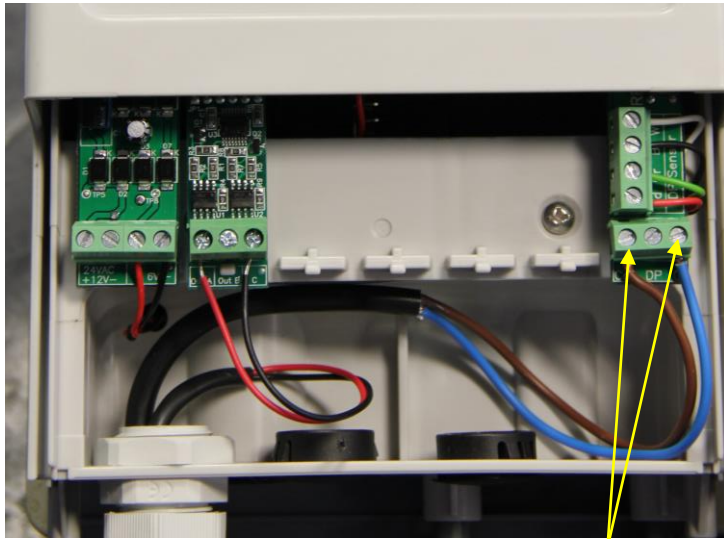
The drawing below shows the wiring of the DC model of the controller.

Notice that:

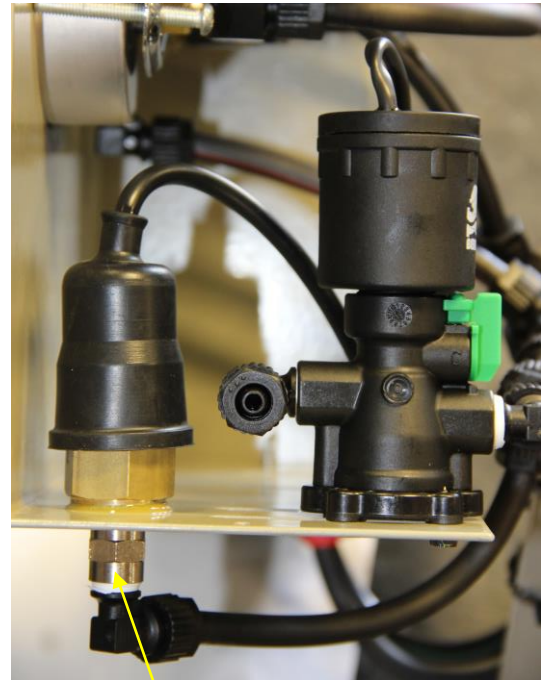
1. The External DP sensor is optional and it is intended for use in cases there is no Embedded Electronic DP included.
2. The powering of the unit can be either by 6v DC or 12v DC.
3. The solenoids will be of 12VDC latch.



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



Connection to
pressure switch



DC Control
Pressure switch

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