

UDI[®] ***Hydraulic Filter*** **CE**

Series 853A

Operator's Manual

Models

853A02 (2")

853A03 (3")

853A04 (4")

853A06 (6")

853A08 (8")

853A10 (10")

853A12 (12")

853A14 (14")

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

SECTION 1 - TECHNICAL SPECIFICATION

General Data

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

For other pressure consult UDI Irrigation representative

Screen Area & Maximum Flow Rates

Model	Inlet/Outlet Diameter		Max. Flow Rate		Flush Flow Rate		Screen Area	
	inch	mm	m ³ /h	gpm	m ³ /h	gpm	cm ²	inch ²
853A02	2"	50	25	110	11	48	2500	390
853A03	3"	80	40	170	11	48	2500	390
853A04	4"	100	80	350	16	70	4000	620
853A06	6"	150	150	660	16	70	4000	620
853A08	8"	200	300	1300	22	97	6000	930
853A10	10"	250	400	1750	22	97	6000	930
853A12	12"	300	470	2050	28	123	8000	1240
853A14	14"	350	550	2400	28	123	8000	1240

The maximum flow rate refers to screens over 200 microns/ less than 80 mesh
For a finer filtration degrees consult UDI Irrigation representative.

Screen Grades

mesh	500	300	200	150	120	100	80	50	40
micron	30	50	80	100	120	150	200	300	400

* Other screen grades are available.

Control System

The control system consists of an AC flushing controller, external differential pressure switch and a solenoid valve. The differential pressure switch is pre-adjusted.

MATERIALS

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

Filtration Screens: Sintered multi-layer screen - Stainless Steel 316

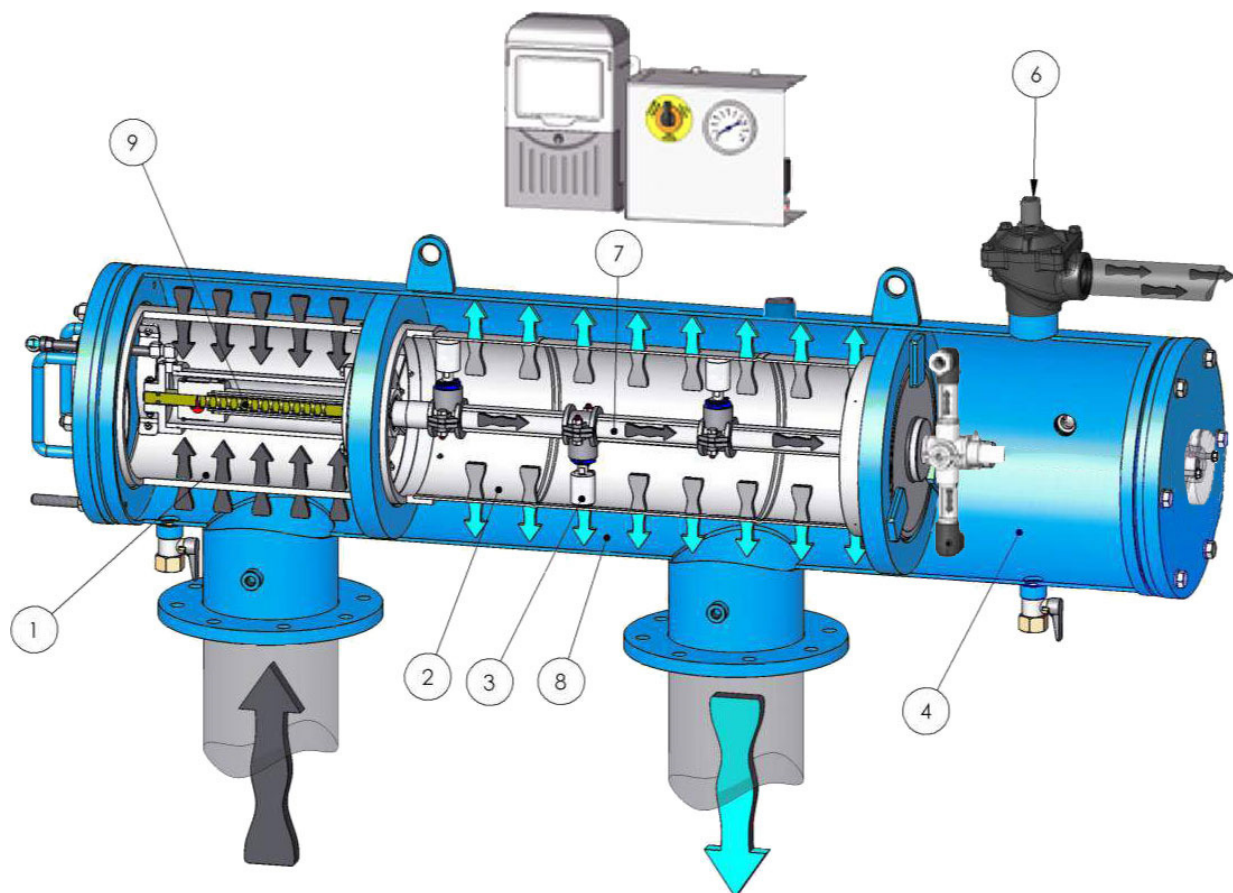
Gaskets : SBR (Synthetic Rubber)
Optional - other materials

CONSTRUCTION

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

For special applications; contact your UDI Irrigation representative for more information.

SECTION 2 - OPERATING PRINCIPLE



A. Filtration Mode

The raw water enters the filter inlet and passes through the coarse screen (1), the first stage of filtration. This prevents passage of any large particles, which may damage the filter internals.

After coarse filtration the water flows through the inside of the filter to the internal side of the fine screen (2). The water passes through the screen from inside out to the filtered water chamber (8) and flows out through the outlet.

As the water passes through the fine screen, the solids accumulate creating a cake of dirt on the inner surface of the screen; as a result the pressure drop across the

screen increases, and when it reaches a preset level (0.5 bar / 7.5 psi) the filter controller activates the self cleaning process.

B. Flushing Mode

On a flushing command, the flushing controller (10) energizes the solenoid valve, the flushing valve (6) opens to the atmosphere and creates pressure drop in the motor chamber (4). As a result, water with dirt from the screen begins flowing (sucked in) through the suction nozzles (3) and collector pipe (7) and hydraulic motor (5) to the drain via flushing chamber (4) and flushing valve (6).

The pressure differential created at the nozzles provides a local back-flushing effect, drawing a portion of the water back from the filtered water chamber (8) through the screen (2) and removing the accumulated solids. The water passing through the collector is ejected out through the hydraulic motor, imparting a rotational movement to the collector. The collector begins to move longitudinally, allowing the nozzles to sweep the entire screen area in a helical motion. The collector assembly is driven by hydraulic motor that is connected through the collector to a reversing unit (9). The reversing unit enables a continuous linear movement (back and forth) of the collector assembly.

The flushing cycle duration and interval are manually adjusted via the controller. These parameters come preset from the factory, and should only be adjusted when absolutely necessary (according to raw water dirt load).

Upon completion of the flushing cycle, the solenoid valve is de-energized; closing the flushing valve. The dirt collector assembly stops at any given position waiting for the next flushing cycle.

SECTION 3 - INSTALLATION PROCEDURES

3.1 - ASSEMBLY PRIOR TO INSTALLATION

The filter is normally supplied fully assembled.



Electrical connections will be done by authorized personal only.

3.2 - PIPING CONNECTIONS

A. Filter Installation

The UDI Irrigation filter may be installed in any position, although for ease of maintenance, a horizontal installation is recommended.

1. For best results, the filter should be installed as near as possible to the system it is required to protect. However, if low filter inlet pressure is a concern, either before or during flushing, the filter may need to be installed closer to the pressure source.

2. Ensure that the upstream pipe size from the pressure source to the filter is equal to or greater than the filter's inlet size.
3. It is strongly recommended to install an isolation valve at the filter's inlet, and a check valve, or an isolation valve at the filter's outlet.
4. An inlet isolation valve must be installed in situations where the pressure source cannot be shut down for maintenance.
5. Inlet/outlet and by-pass valves must be installed in situations where a constant supply of water is required downstream during filter servicing.
6. Ensure that the filter is mounted in the proper flow direction, as indicated by the arrows on the filter housing. As a check, the inlet is closer to the cover end of the filter.
7. Ensure that sufficient space is provided around the filter for maintenance.

B. Drain Line Installation.

A drain line should be attached to each flushing valve, as follows:

- The back pressure at the flush valve outlet should not exceed 3 meters (0.3 bar, 4.5 psi)
- Piping should be installed level or pitch down to avoid back-pressure.
- The open end of piping should be securely mounted to avoid fluttering during flushing cycle.

SECTION 4 - FIRST COMMISSIONING AND ROUTINE START-UP

NOTE: It is very important that the external disc filter (item 24) will be kept clean for the efficient operation of the self cleaning process

Filter Initial pre-sets

- 1. The differential pressure switch has been set to 5m (0.5 bar, 7 psi).**
- 2. Flushing duration has been set to 25 seconds**
- 3. Flushing interval (time between one flush to the next one) has been set to 2 hours.**


4.1 - FIRST COMMISSIONING

1. Connect the controller to power source.
2. Check that the line pressure will always be at least 2 bar at the filter's inlet, during the flushing cycle.
3. Check that there are no upstream pipeline restrictions.

4. Check that the filter is mounted in the correct flow orientation as indicated by the arrows on the filter's body.
5. Check that the flushing valve drain line is installed as described in section 3.2 B.
6. Check that the upstream and downstream isolation valves are closed, if equipped.
7. Verify that pressure equalization filter drain valve is closed.
8. Check that the emptying line manual valve is closed, if equipped.
9. Check that adequate space is available around the filter for maintenance.

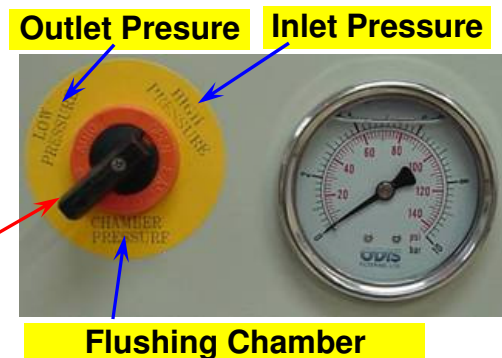
NOTE: The differential pressure switch and timer have been preset to the proper settings. Do not adjust prior to start-up.

4.2 - START-UP

1. Open slowly the filter's inlet valve to allow the filter to pressurize.
2. Check external leakage and eliminate, if there is any.
3. Check that the filter's inlet pressure is higher than 2 bar (30 psi).
4. Open slowly the filter's outlet valve (if installed).
5. Initiate a manual flushing cycle by pressing the manual button  on control box panel

During this flushing:

- ✓ Observe the movement of the collector via the indicating sight on the rear cover of the filter.
- ✓ Check the inlet and hydraulic motor chamber pressures. The hydraulic motor chamber pressure should be 1.8 bar (18mWC) below inlet pressure during the flushing cycle (use three way valve and manometer mounted on the control box).



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.

SECTION 5 - 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.

A flushing sequence can be manually activated by pressing the manual key. The same key will be used for manually terminating a sequence in progress.



SECTION 6 – SHUT DOWN & DRAINING PROCEDURES

6.1 - SHUT DOWN PROCEDURE

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).

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 on the inlet of the filter
4. Initiate an additional manual flushing cycle to relieve the pressure in the filter, or if equipped with a manual drain valve, open it.

6.2 - DRAINAGE PROCEDURE

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

In order to prevent any damage to surrounding equipment or property, it is recommended that a drain line equipped with a manual valve be installed at the lowest available port for this purpose.

To empty the filter:

1. Perform the shut down procedure as described in Section 6.1.
2. Reduce pressure to zero (0).
3. The air Release Valve will introduce air to vent the filter.
4. Open the manual valve on the drain line.

SECTION 7 – PREVENTIVE MAINTENANCE & INSPECTIONS

Following is a schedule of preventive maintenance and inspections based on average filtration duty, and should be used as a guideline only. For best results, a maintenance schedule should be compiled based on experience gained from using the filter. Maintenance kit part no. KT85860 (paint and grease) is attached to the filter.

NOTE: (Item no. ___) refers to the breakdown drawings on section 10.

NOTE: before installing bolts back to their places spread the bolts threads with "MOLYKOTE G-n Plus Paste" or equivalent.

NOTE: before installing seals and O-rings back to their places, apply silicone grease "OKS 1110/0" or "ROCOL – SAPPHIRE® Aqua-Sil" or equivalent grease (unless otherwise noted).

7.1 Daily

- ✓ Repair any damage to the protective coating of the filter without delay. Prior to application of protective paint, thoroughly clean the damaged spot with wire brush.
- ✓ Every two weeks when the filter is not in operation dismantle the external disc filter (item no. 24) and rinse the discs thoroughly using clean water as follows:

7.2 Monthly

- ✓ On units equipped with by-pass valve, the by-pass should be engaged at least once a month. This will clean the valve seat of any accumulated dirt, as well as ensuring proper by-pass operation.

7.3 Quarterly

- ✓ Check coarse screen and clean as required (item no. 7).
- ✓ Trigger a manual rinse and check for proper filter function by observing the pressures as described in Section 4.2. This step should be performed for all individual filters in multiple installations.

7.4 Yearly

7.4.1 Remove the screen assembly for inspection of the fine screen and the drive assembly as follows:

- Open the filter rear cover (item no. 4) and dismantle the hydraulic motor (item no. 9/4) from the collector pipe by removing the saddle thread locks (on models 2"....6") / attaching bolts (on models 8"....14") and dismantling the hydraulic motor saddle.
- Open the filter cover (item no. 3) and carefully pull out the screen assembly using two handles inside the coarse screen.
- Place the screen assembly on a clean working surface in order not to damage the screen.
- Dismantle guide base (item no. 8/7) by removing the attaching bolts in the screen perimeter.
- Dismantle coarse screen (item no. 7) from fine screen (item no. 8) by removing the attaching bolts in the screen perimeter.
- Dismantle reversing unit housing (item no. 13/1) as follows:
 - Unscrew the nut (item no. 13/6) and remove the bolt (item no. 13/5).
 - Unscrew the bolts (item no. 13/3) and remove reversing unit housing.

- Remove O-ring (item no. 14/2) and remove the drive pawl cover (item no. 14/3).
 - Pull out the drive pawl (item no. 14/4) and remove the reversible drive screw (item no. 14/1).
 - Remove the drive pawl housing (item no. 14/5) from the collector assembly (item no. 9/1) by removing the attaching bolts in the drive pawl housing perimeter.
 - Check the drive pawl (item no. 14/4) and the reversible drive screw (item no. 14/1) for wear and damage.
 - Pull out the collector assembly from the screen and perform a visual inspection to the fine screen (item no. 8/1) internal and external surface.
 - Insert back the collector assembly (item no. 9/1) to the screen and install the drive pawl housing (item no. 14/5) to the collector using the attaching bolts.
 - Install the guide base (item no. 8/7) to the screen using the attaching bolts in the screen perimeter.
- 7.4.2 Clean the drive pawl and the reversible drive screw thoroughly and check the items for wear and damage. Re-lubricate the items with "OCEAN 7W" – Aluminum complex EP grease or equivalent and install the unit back as follows:
- Apply lubricant "OCEAN 7W" inside the drive pawl housing (item no. 14/5) and place the reversible drive screw into the drive pawl housing.
 - Apply lubricant "OCEAN 7W" on the drive pawl and install it in its housing, slide the drive pawl cover (item no. 14/3) to its place and install the O-ring stopper (item no. 14/2).
 - Place the reversing unit housing (item no. 13/1), and connect it to the reversible drive screw (item no. 14/1) by using bolt (item no. 13/5) and nut (item no. 13/6). Tighten the nut and release it slightly.
 - Verify that O-ring (item no. 13/2) is intact and place it in its groove, apply lubricant "OCEAN 7W" on the O-ring and install the reversing unit housing (item no. 13/1) using bolts (item no. 13/3), before installing bolts back to their places spread the bolts threads with "MOLYKOTE G-n Plus Paste" or equivalent.
 - Rotate manually the collector assembly and verify that it moves smoothly.
- 7.4.3 Attach coarse screen (item no. 7) to fine screen (item no. 8) by screwing the attaching bolts in the screen perimeter.
- 7.4.4 Lubricate the screen seals (items no. 8/4) with silicone grease "OKS 1110/0" or "ROCOL – SAPPHIRE® Aqua-Sil" or equivalent grease.
- 7.4.5 Insert the screen assembly inside the filter body. Open the service port cover (item no. 6) in order to get convenient access to place the collector assembly in place.
- 7.4.6 Lubricate the cover seal (item no. 2) and service cover seal (item no. 5) with silicone grease "OKS 1110/0" or "ROCOL – SAPPHIRE® Aqua-Sil" or equivalent grease and close both covers and tighten the bolts.
- 7.4.7 Verify that the saddle seal is intact and in place, install the hydraulic motor back on the collector pipe and tighten the attaching bolts / thread locks.
- 7.4.8 Verify that the collector is rotating smoothly by hand force.

7.4.9 Lubricate the rear cover seal (item no. 2) with silicone grease "OKS 1110/0" or "ROCOL – SAPPHIRE® Aqua-Sil" or equivalent grease and close rear cover and tighten the bolts.

7.4.10 Perform start-up procedure for filter (see par. 4.2).

7.5 Two Years

- ✓ Perform yearly maintenance and replace the following parts listed in the following table.
- ✓ It is recommended to replace the drive pawl (item no. 14/4) every two years (if necessary). If the drive pawl was not replaced after two years replace the drive pawl (item no. 14/4) and the reversible drive screw (item no. 14/1) every three years.

Cat. No. for 2 years spare parts kit		Model	
		ER85400	ER85401
Item No.	Description	2", 3", 4", 6"	8", 10", 12", 14"
2	Cover Gasket & Rear Cover Gasket	ER02004 (two units)	ER10033 (two units)
5	Service Cover Gasket	E004365	E004365
8/2	Collector Upper Guide	E863R001	E863R009
8/4	Fine Screen Seal	E263003 (two units)	E8628000 (two units)
8/5	Collector Lower Guide	E854015	E854016
8/6	Guide Stopper	ER00113	ER00113
8/9	Shaft Seal	E863R02162	E863R02163
8/10	Collector wiper	E008813	E008812
13/2	Reversible Housing Seal	E863R005	E863R005
14/1	Reversible Drive Screw	E863R012	E863R012
14/4	Drive Pawl	E863R011	E863R011
24	Disc Filter	2107R-DS-120RD	2107R-DS-120RD

- ✓ For replacing rear cover (item no. 4) cover gasket (item no. 2) dismantle the rear cover by removing the attaching bolts.
- ✓ Replacing collector upper guide (item no. 8/2) and upper guide seal (item no. 8/9), collector lower guide (item no. 8/5) and collector wiper (item no. 8/10) is performed when the fine screen (item no. 8/1) is dismantled (for instructions see par.7.5.1):
 - Item 8/2 can be removed by hand force, by pressing it from inside out.
 - Replacing upper guide seal (item no. 8/9); **pay attention to direction of installation of item 8/9**, lubricate the new seals with silicone grease "OCEAN 7W" or equivalent grease

- Item 8/5 can be removed by hand force, by removing the seal (item no. 8/6) and pressing it slightly.
- Wiper (item 8/10) is inserted inside item 8/5, before replacing it **pay attention to direction of installation** and place a new one.

7.6 Instruction for Cleaning the Screen

It is recommended to take out the filter screen for cleaning and checking every one year or 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 before the using chemicals.

SECTION 8 – 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; on DC models take out batteries / on AC models disconnect the mains plug/ 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. Automatic filters equipped with Reversing Housing Assy:
 - 9.1. Open the connection of the equalization pipe on the filter's front cover, drain the water from the pipe and close it back.

SECTION 9 – FLUSHING CONTROL BOX

The Flushing Control Box provides control of interval between the flushing cycles and the flushing time. (For operation instructions see pages 25-30)

SECTION 10 – TROUBLESHOOTING

A malfunctioning filter can be found in one of the following modes:

Section 10.1 - The filter does not experience flushing cycles (automatic or manual).

Section 10.2 - The filter flushes continuously (flushing valves do not close).

Section 10.3 - The filter cycles continuously (flushing valves open and close repeatedly).

Section 10.4 – No indication on controller display.

10.1 – THE FILTER DOES NOT EXPERIENCE FLUSHING CYCLES (AUTOMATIC OR MANUAL)

- 1) Check the differential pressure across the filter. If the differential is higher than the preset 5m (0.5 bar, 7 psi), go the step 5.
- 2) If the differential is lower than the preset, monitor the differential pressure across the filter to determine whether it is increasing. If it is increasing, allow the differential to increase to the preset value and monitor operation.
- 3) If it is not increasing, or is increasing very slowly, shut down the filter and extract the fine screen .
Carefully inspect the screen and O-rings for damage. Replace parts as necessary. When reinstalling the screen, check to ensure that it is seating properly inside the housing. The gap between the nozzles and the screen should be 1 to 1.5 mm.
- 4) If the screen is intact and is seating properly, the motor is relatively clean or the apertures may be too large for the particular application. Contact your dealer for assistance.
- 5) If the differential is higher, check to ensure that control box power switch is not off, but it is indicating ON.

- 6) Initiate a manual flushing cycle by depressing the manual button. If the filter rinses, check the differential pressure switch hydraulic and electric connections, and repair or replace as necessary. Recheck operation if it malfunctions still – replace DP switch.
- 7) If the filter does not flush, check to ensure that the solenoid valve is being energized. Repair or replace as necessary.
- 8) Check to ensure that during flushing command the solenoid valve does not deliver water pressure to the top portion of the flushing valve. If there is water pressure in the command pipe, check for blockages in the solenoid valve. If no flow exists at command pipe, shut down the filter, remove the flushing valve actuators and check for blockages which may prevent the valves from opening. Recheck operation.
- 9) If there is low flow or pressure, check for blockages in the tubing and manifold.
- 10) Close the isolation valve at the filter's outlet and allow the inlet and outlet pressures to equalize. Initiate a manual flushing cycle. If the filter does not flush, go to step 15.
- 11) If the filter flushes, open the outlet valve and recheck the differential pressure. If the differential pressure has recovered, the filter was probably blocked due to an influx of dirt. Allow the differential to buildup and monitor filter operation.
- 12) If the differential has not recovered, check to ensure that the inlet pressure during the flushing cycle is greater than the minimum required as indicated in Section 3.2.A .
- 13) Check the inlet pressure versus the hydraulic motor chamber pressure for sufficient pressure drop as indicated in Section 4.2. If not sufficient, check for restrictions or sources of back-pressure in the flushing valve line.
- 14) If the pressure drop is sufficient and the differential pressure is not recovering after several additional manual-flushing cycles with the outlet valve closed, the filter must be shut down and the external disc filter and the internal mini screen filter must be checked for clogging and cleaned manually.
- 15) If the pressure drop is sufficient and the differential pressure is not recovering after several additional manual-flushing cycles with the outlet valve closed, the filter must be shut down and the screen extracted and cleaned manually.
- 16) If the filter does not flush at step 10, check the tubing connections and solenoid valves. Repair or replace as necessary. Recheck operation.
- 17) If no flushing occurs, the control box should be checked. Contact your dealer.

10.2 - THE FILTER FLUSHES CONTINUOUSLY (FLUSHING VALVE DO NOT CLOSE).

- 1) Verify that the manual / automatic Selector “knob” on the solenoid valve is in automatic position.

- 2) If in the automatic position, still flushing - disconnect the flexible tube connected to the valve's top side. If the line is pressurized, check if the valve is stuck because of a mechanic reason, replace if necessary.
- 3) In case that the above line is not pressurized, replace the solenoid valve.

10.3 - THE FILTER FLUSHES CONTINUOUSLY (FLUSHING VALVE OPEN AND CLOSE REPEATEDLY).

- 1) Check the differential pressure across the filter before flushing .
- 2) Check the differential pressure across the filter following a flushing cycle. If the differential pressure does not recover, go to Step 12 of Section 10.1.
- 3) If the flow is within the operating range of the filter and the differential pressure recovers, a larger screen and/or additional filters may be required.

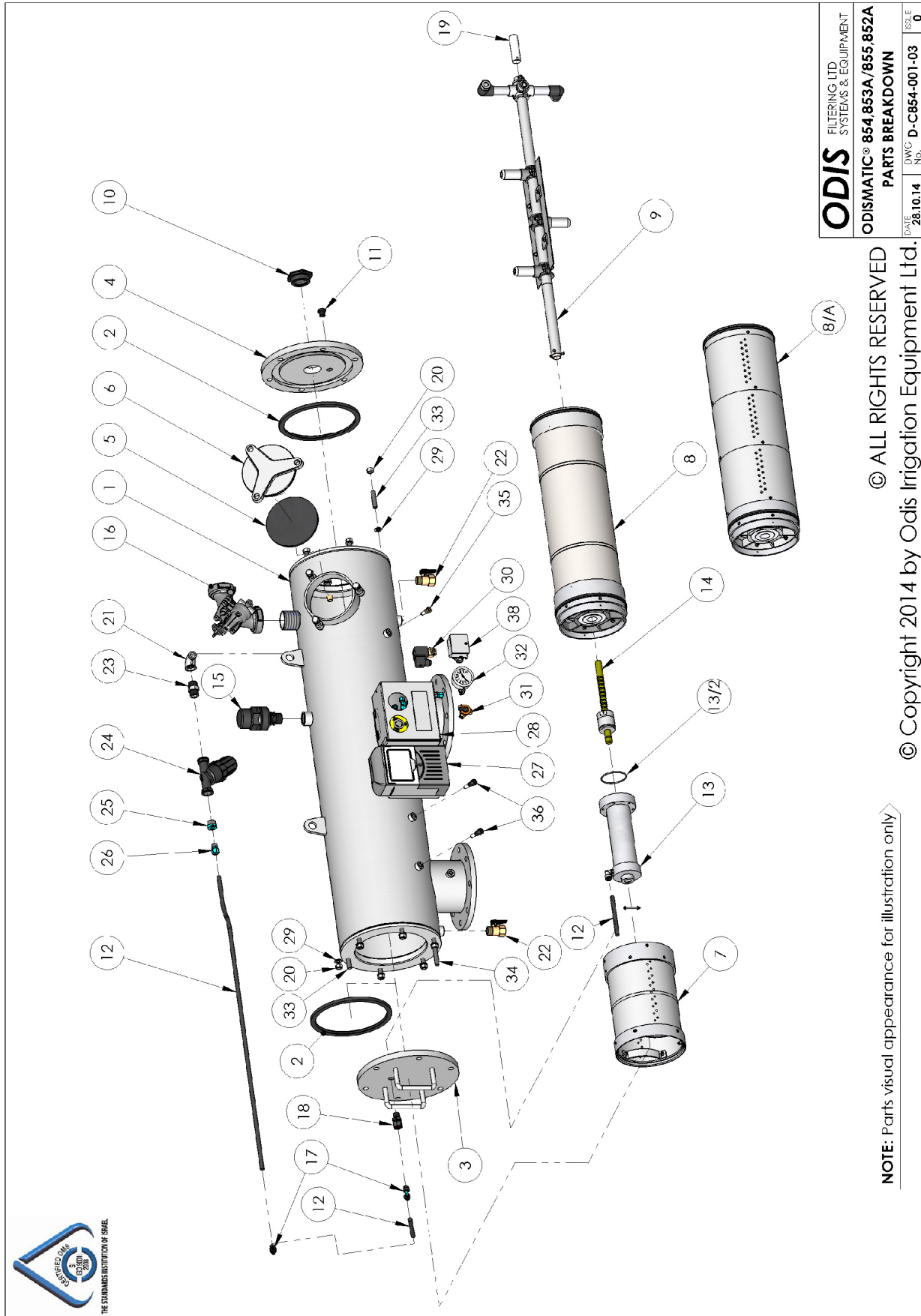
10.4 – NO INDICATION ON CONTROLLER DISPLAY

- 1) Check that the power source is operative and there are no disconnected wires. If it still off, replace the control box.

SECTION 11 – SPARE PARTS

The following page depicts a typical filter assembly and indicates proper part description and location. Please refer to these descriptions when ordering spare parts.

Illustrated Parts Breakdown – General

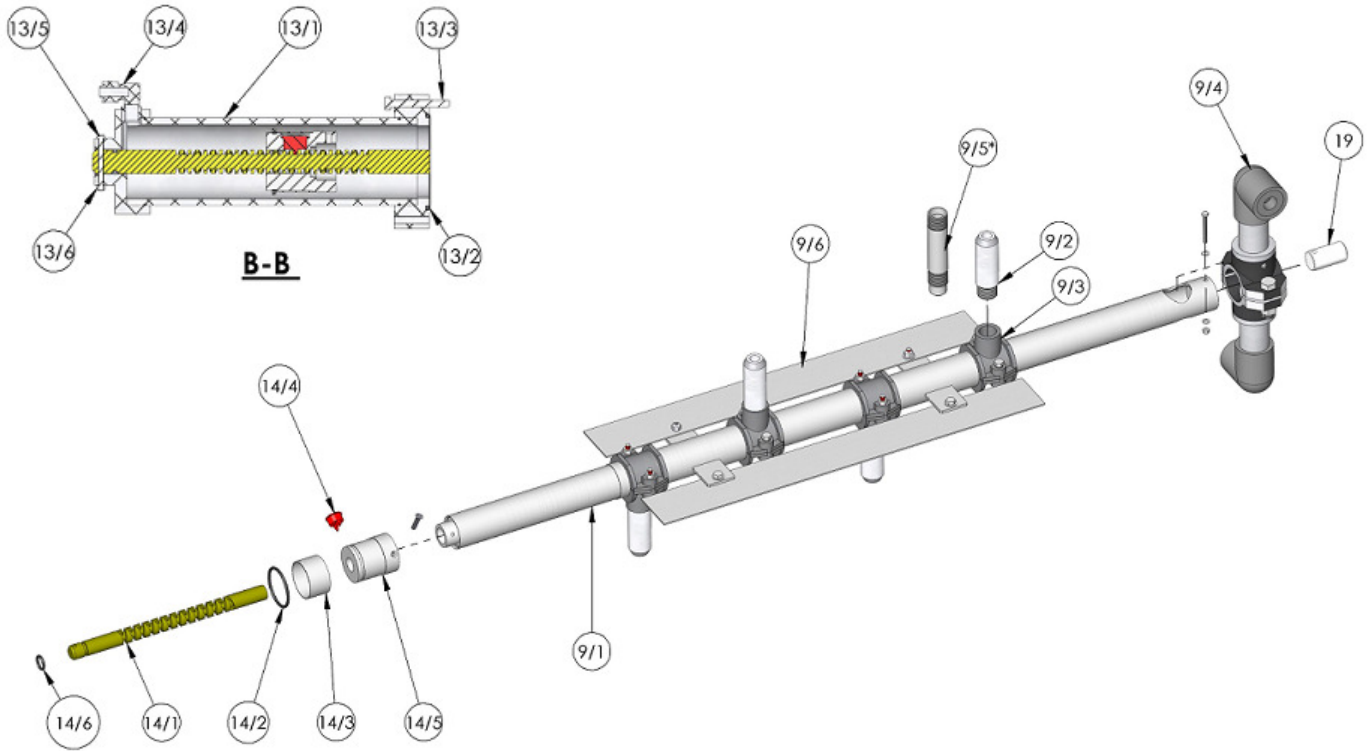


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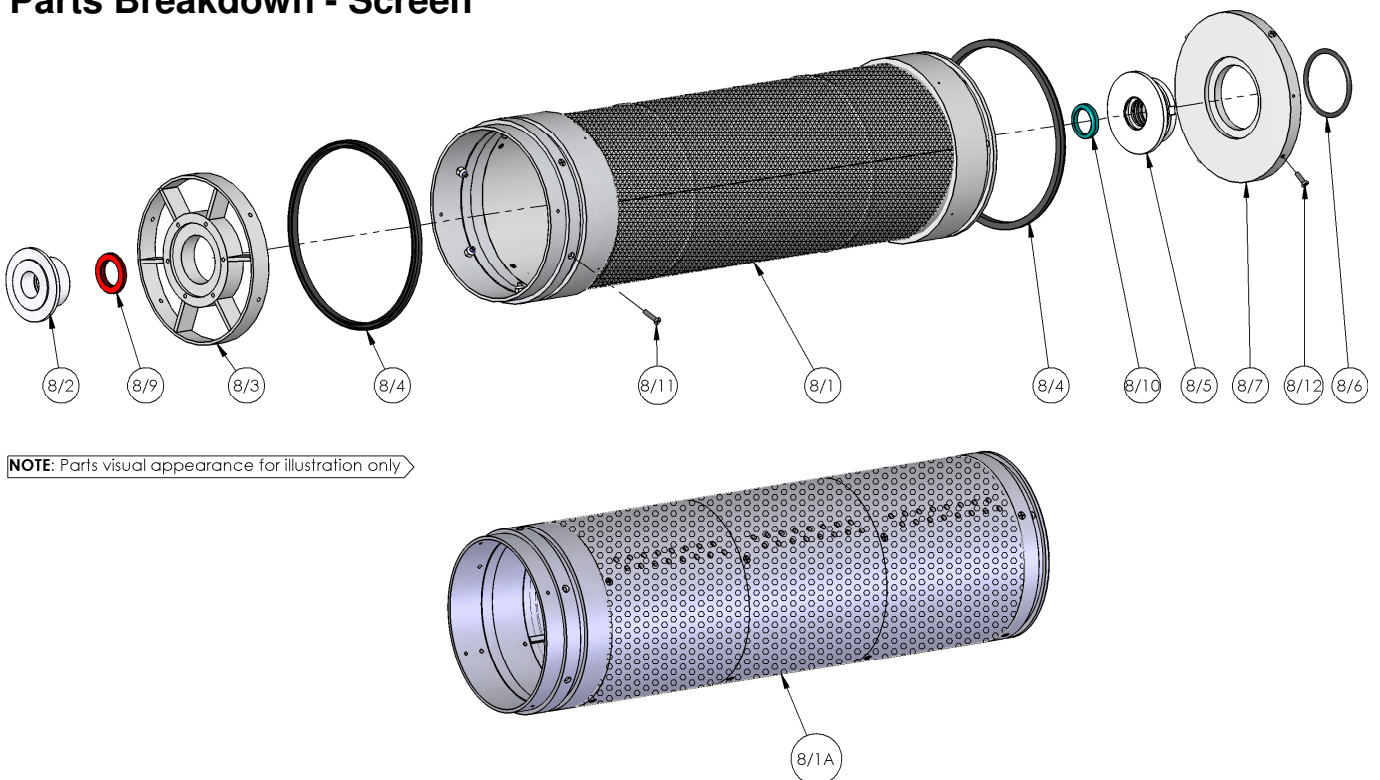
NOTE: Part's visual appearance for illustration only

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Illustrated Parts Breakdown – Self Cleaning Assembly Illustrated



Parts Breakdown - Screen



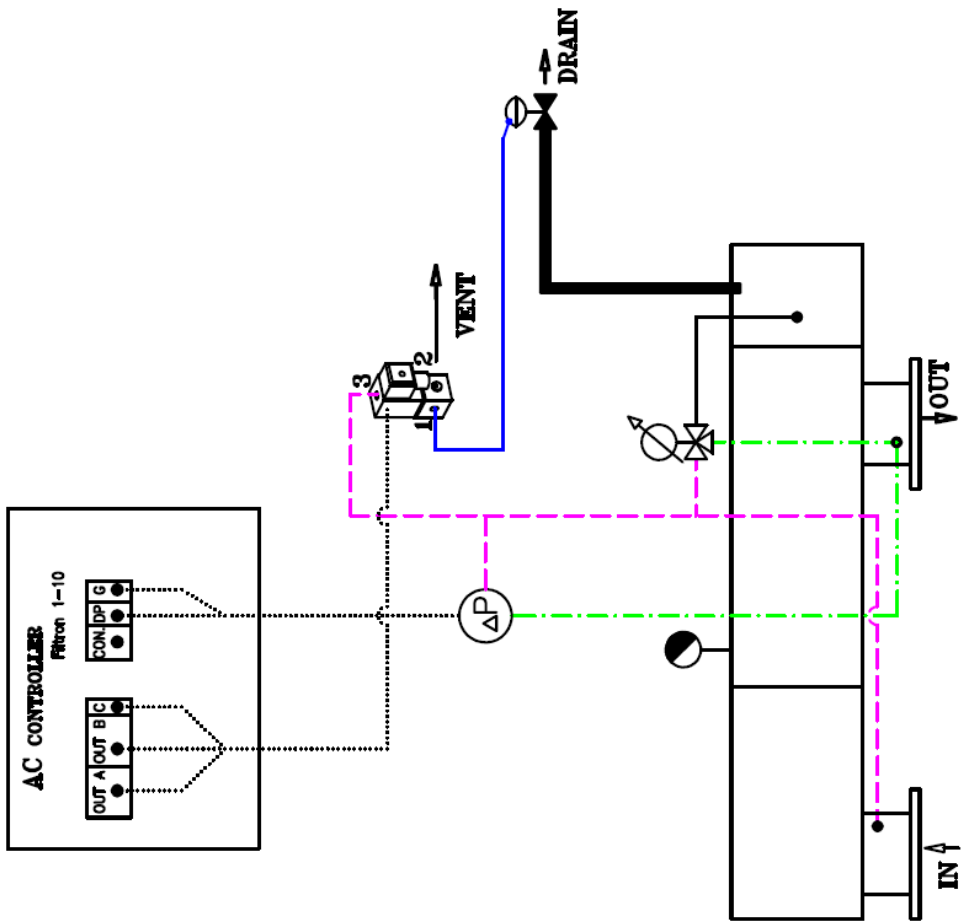
NOTE: Parts visual appearance for illustration only

Part List

Part No.	Description	853A02 853A03	853A04 853A06	853A08 853A10	853A12 853A14
1	Filter Body	A85402 A85403	A85404 A85406	A85408 A85410	A85412 A85414
2	Cover Gasket	ER02004	ER02004	ER10033	ER10033
3	Front Cover	E863R02050	E863R02050	E863R08050	E863R08050
4	Rear Cover	E854013	E854013	E854014	E854014
5	Service Port Gasket	E004365	E004365	E004365	E004365
6	Service Port Cover	E400260-SFR	E400260-SFR	E400260-SFR	E400260-SFR
7	Coarse Screen	E854001	E854001	E854002	E854003
8	Fine Screen Assy. Sinter	E854017	E854018	E854019	E854020
8A	Fine Screen Assy. PVC	E854023	E854024	E854025	E854026
8/1	Fine Screen Sinter	E863R02031	E863R04031	E863R08031	E863R12031
8/1A	Fine Screen PVC	E863R02131	E863R04131	E863R08131	E863R12131
8/2	Collector Upper Guide	E863R001	E863R001	E863R009	E863R009
8/3	Upper Guide Base	E863R002-PL	E863R002-PL	E863R008-PL	E863R008-PL
8/4	Fine Screen Seal	E263003	E263003	E8628000	E8628000
8/5	Collector Lower Guide	E854015	E854015	E854016	E854016
8/6	Guide Stopper	ER00113	ER00113	ER00113	ER00113
8/7	Guide Base	E86302033	E86302033	E86308033	E86308033
8/8	-----	-----	-----	-----	-----
8/9	Seal	E863R02162	E863R02162	E863R02163	E863R02163
8/10	Wiper	E008813	E008813	E008812	E008812
8/11	Bolt	L2506131624U	L2506131624U	L2506131624U	L2506131624U
8/12	Bolt	L2506131619U	L2506131619U	L2506131619U	L2506131619U
9	Dirt Collector Assy.	E853R01602	E853R01604	E853R01608	E853R01612
9/1	Dirt Collector Body	E853R00902	E853R00904	E853R00908	E853R00912
9/2	Suction Nozzle Assy.	E853R2211	E853R2211	E853R2811	E853R2811
9/3	Nozzle Base	E863R073	E863R073	E863R072	E863R072
9/4	Hydraulic Motor	E853R1603	E853R1606	E853R1611	E853R1611
9/5	Adaptor	N.A	N.A	N.A	N.A
9/6	Collector Wings	ER1001	ER1002	ER1003	ER1004
10	Indicating Sight	E854012	E854012	E854012	E854012
11	Plastic Cap	H070305	H070305	H070305	H070305
12	Pipe	B16121	B16121	B16121	B16121
13	Reversing Housing Assy.	E864070	E864070	E864070	E864070
13/1	Reversing Housing	E863R004A	E863R004A	E863R004A	E863R004A
13/2	Seal	E863R005	E863R005	E863R005	E863R005
13/3	Bolt	L29106104050U	L29106104050U	L29106104050U	L29106104050U
13/4	Adapter	T4350002	T4350002	T4350002	T4350002
13/5	Bolt	L29314050M	L29314050M	L29314050M	L29314050M
13/6	Nut	L1230040	L1230040	L1230040	L1230040
14	Reversing Unit Assy.	E863R015	E863R015	E863R015	E863R015
14/1	Reversible Drive Screw	E863R012	E863R012	E863R012	E863R012
14/2	Stopper	ER00109	ER00109	ER00109	ER00109
14/3	Cover	E863R013	E863R013	E863R013	E863R013

Part No.	Description	853A02 853A03	853A04 853A06	853A08 853A10	853A12 853A14
14/4	Drive Pawl	E863R011	E863R011	E863R011	E863R011
14/5	Housing	E863R010	E863R010	E863R010	E863R010
14/6	Seal	E004005	E004005	E004005	E004005
15	Air Valve	N12401-PN10	N12401-PN10	N12402-PN10	N12402-PN10
16	Flush Valve	NOV1002002T	NOV1002002T	NOV1002002T	NOV1003002T
17	Adapter	T4350003	T4350003	T4350003	T4350003
18	Adapter	E854022	E854022	E854022	E854022
19	Indicator	E854010	E854010	E854011	E854011
20	Nut	L0612102U	L0612102U	L0610304U	L0610304U
21	Elbow	H87005BSP	H87005BSP	H87005BSP	H87005BSP
22	Valve	PM1050110	PM1050110	PM1050110	PM1050110
23	Adapter	H61007	H61007	H61007	H61007
24	Filter	2107R-DS-120RD	2107R-DS-120RD	2107R-DS-120RD	2107R-DS-120RD
25	Bushing	H0510207BSP	H0510207BSP	H0510207BSP	H0510207BSP
26	Adapter	T4350001	T4350001	T4350001	T4350001
27	Controller-AC	N5312111	N5312101	N5312101	N5312101
28	Pressure Control Box	Y8510201-MG	Y8510201-MG	Y8510201-MG	Y8510201-MG
29	Washer	L400012	L400012	L400020	L400020
30	Solenoid Valve-AC	N512009-8W	N512009-8W	N512009-8W	N512009-8W
31	3 Way Valve	PM202500	PM202500	PM202500	PM202500
32	Pressure Gauge	N611026	N611026	N611026	N611026
33	Stud	ER06099	ER06099	L3319304070U	PM202500
34	Long Stud	E863R120	E863R120	ER10069	N611026
35	In Line Mini Filter	N511006	N511006	N511006	ER10069
36	In Line Short Filter	N511012	N511012	N511012	L2919304045U
37	-----	-----	-----	-----	-----
38	Differential Pressure Switch	N6040	N6040	N6040	N6040

Control Diagram (AC)



LEGEND

- COMMAND LINE
- ELECTRICAL LINE
- HIGH PRESSURE LINE
- LOW PRESSURE LINE
- FLUSH CHAMBER PRESSURE (DURING FLUSHING)

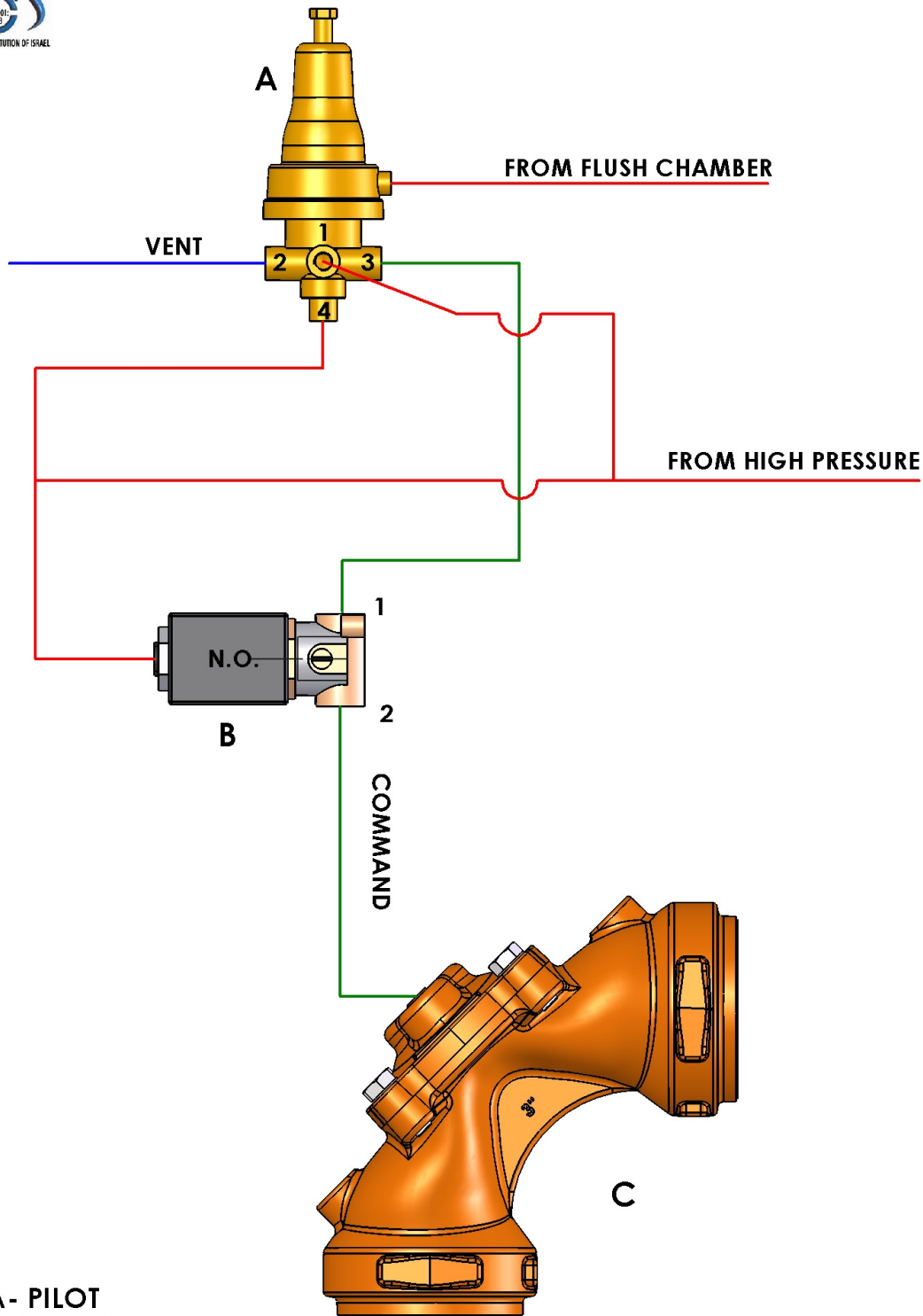
- DIFFERENTIAL PRESSURE SWITCH (DP)
- SOLENOID VALVE -GEM-SOL-AC (SHOWN OPEN DURING FILTERING PROCESS)
- FLUSHING VALVE (SHOWN CLOSED DURING FILTERING PROCESS)
- OUTLET HYD. VALVE (SHOWN CLOSED DURING FLUSHING PROCESS)
- PRESSURE GAUGE
- 3 WAY VALVE
- AIR RELEASE VALVE

ODIS Irrigation Equipment Ltd	
TITLE Odismatic®-852A/853A	
DATE 01.02.15	DWG No.117191-B-AC-ODP
ISSUE 1	DIAGRAM

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Flush Valve Control Scheme - AC



A- PILOT
B- N.O. SOLENOID
C- FLUSH VALVE

ODIS FILTERING LTD SYSTEMS & EQUIPMENT		
853R/63R/52R/62R/54/55/64/65 AC		
FLUSH VALVE CONTROL SCHEME		
DATE 23.08.11	DWG No. D-0416-035-01	ISSUE 2

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HEAD LOSS/FLOW RATE

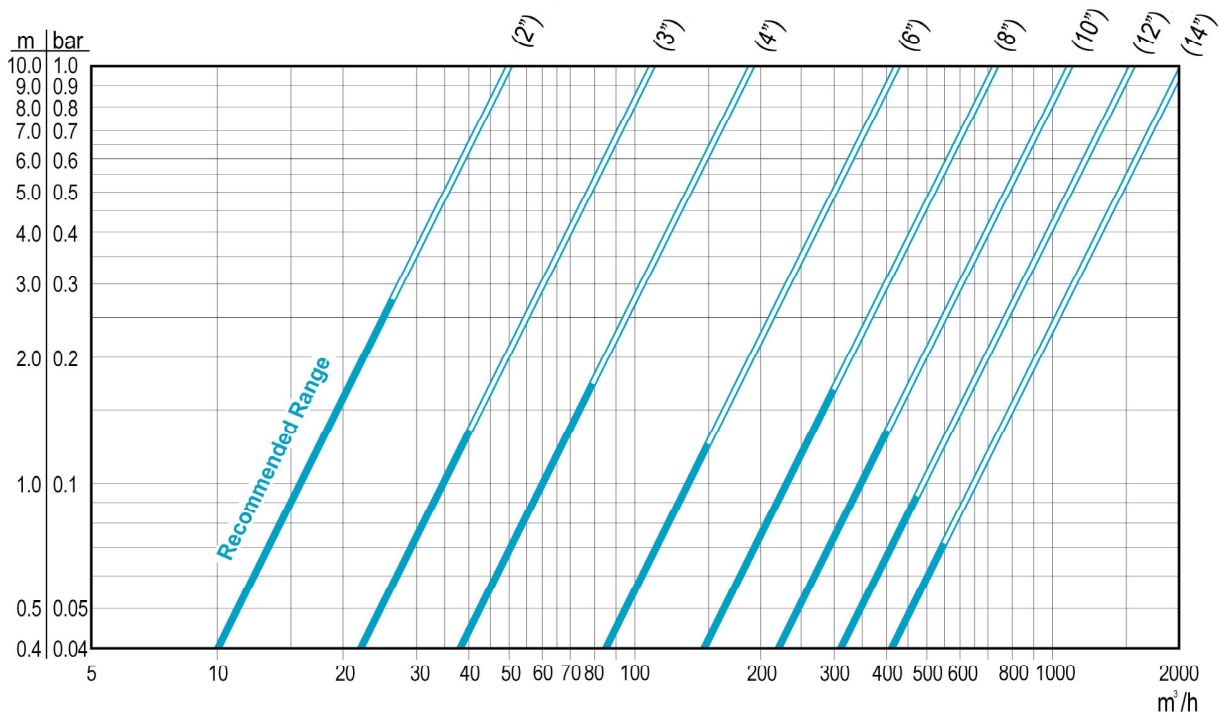
Metric Units

Head Loss **

Model	Flow Rate Q (m³/h)												
	15	20	25	50	75	100	125	150	200	250	300	350	400
(2")	0.09	0.16	0.25	1.00									
(3")			0.05	0.21	0.46	0.83							
(4")				0.07	0.16	0.28	0.44	0.64	1.13				
(6")						0.06	0.09	0.12	0.22	0.35	0.50	0.68	0.89

Model	Flow Rate Q (m³/h)												
	200	300	400	500	600	700	800	900	1000	1200	1500	1800	2000
(8")	0.08	0.17	0.30	0.47	0.68	0.92	1.20						
(10")		0.07	0.13	0.21	0.30	0.40	0.53	0.67	0.83	1.19			
(12")			0.07	0.11	0.15	0.21	0.27	0.34	0.42	0.61	0.95		
(14")				0.06	0.09	0.12	0.15	0.19	0.24	0.35	0.54	0.78	0.96

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

HEAD LOSS/FLOW RATE

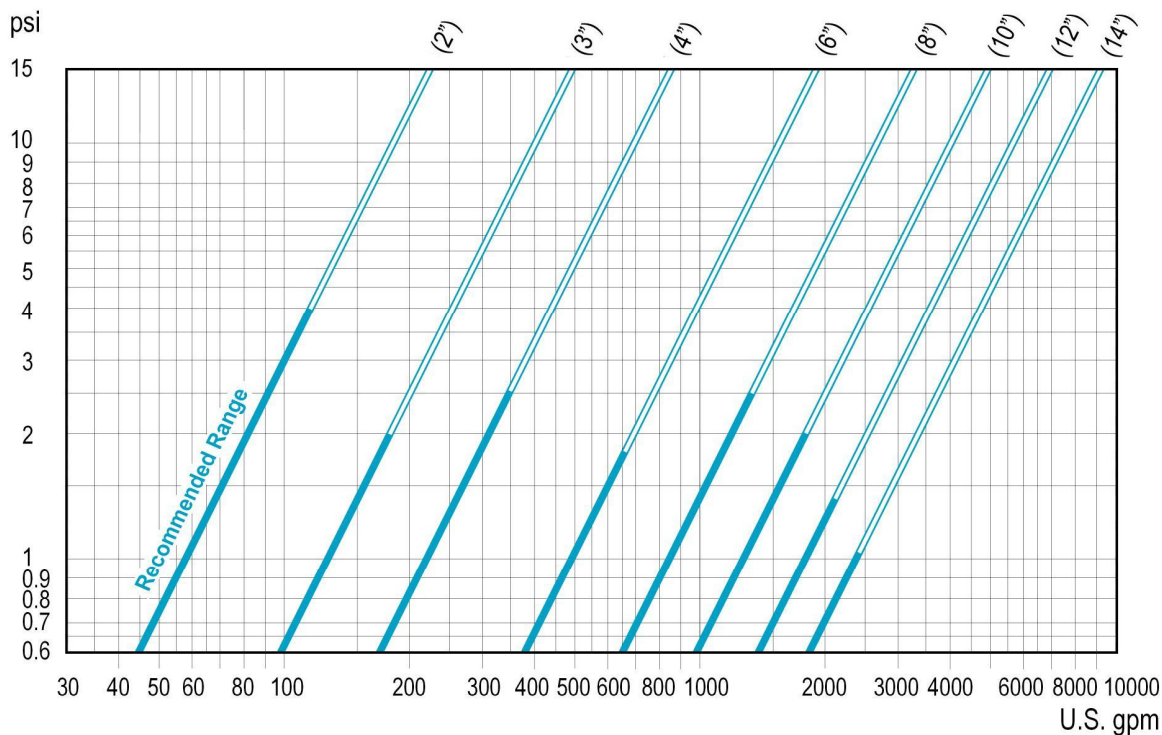
U.S. Units

Head Loss **

Model	Flow Rate Q (U.S. gpm)												
	50	90	120	200	300	450	600	700	900	1100	1300	1500	1800
	Head Loss dP (psi)												
(2")	0.7	2.4	4.3	12.0									
(3")		0.5	0.9	2.5	5.6	12.5							
(4")				0.8	1.9	4.3	7.6	10.4	17.1				
(6")						0.8	1.5	2.0	3.4	5.0	7.0	9.3	13.4

Model	Flow Rate Q (U.S. gpm)												
	900	1300	1500	1800	2000	2600	3000	3500	4000	4500	5000	6500	8000
	Head Loss dP (psi)												
(8")	1.1	2.4	3.2	4.5	5.6	9.5	12.6	17.2					
(10")	0.5	1.0	1.4	2.0	2.5	4.2	5.6	7.6	9.9	12.5	15.5		
(12")		0.5	0.7	1.0	1.3	2.1	2.8	3.9	5.0	6.4	7.9	13.3	
(14")				0.6	0.7	1.2	1.6	2.2	2.9	3.6	4.5	7.6	11.5

Head Loss/Flow Rate **



** For a clean filter and 120 mesh screen

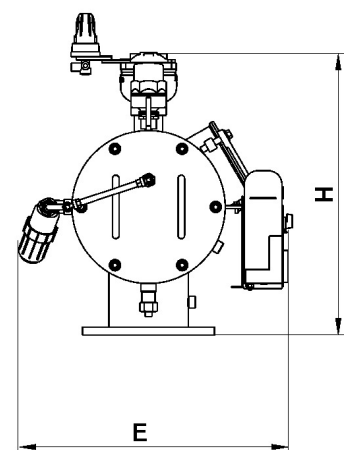
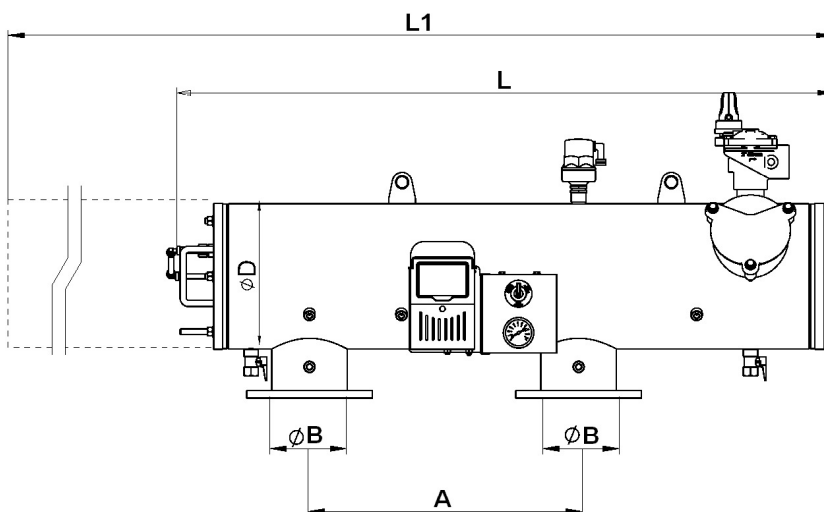
■ 1 psi=0.069 bar=6.9 kPa=0.07 kg/cm²=0.7 m (W.C)

Dimensions & Weight Metric Units

Model	B		D	A	E	H	L	L1	Weight
	mm	inch	inch	mm	mm	mm	mm	mm	kg
853A02	50	2"	12"	430	680	630	1280	2280	159
853A03	80	3"	12"	430	680	630	1280	2280	162
853A04	100	4"	12"	600	680	630	1470	2580	195
853A06	150	6"	12"	600	680	630	1470	2580	200
853A08	200	8"	16"	780	740	800	1720	3080	295
853A10	250	10"	16"	780	740	800	1720	3080	300
853A12	300	12"	16"	990	740	800	2030	3630	335
853A14	350	14"	16"	990	740	800	2030	3630	360

Dimensions & Weight U.S. Units

Model	B	D	A	E	H	L	L1	Weight
	inch	inch	inch	inch	inch	inch	inch	lbs
853A02	2"	12"	16.9	27	25	51	90	350
853A03	3"	12"	16.9	27	25	51	90	357
853A04	4"	12"	23.6	27	25	58	102	430
853A06	6"	12"	23.6	27	25	58	102	440
853A08	8"	16"	30.7	29	32	68	121	650
853A10	10"	16"	30.7	29	32	68	121	661
853A12	12"	16"	39	29	32	80	143	738
853A14	14"	16"	39	29	32	80	143	794



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

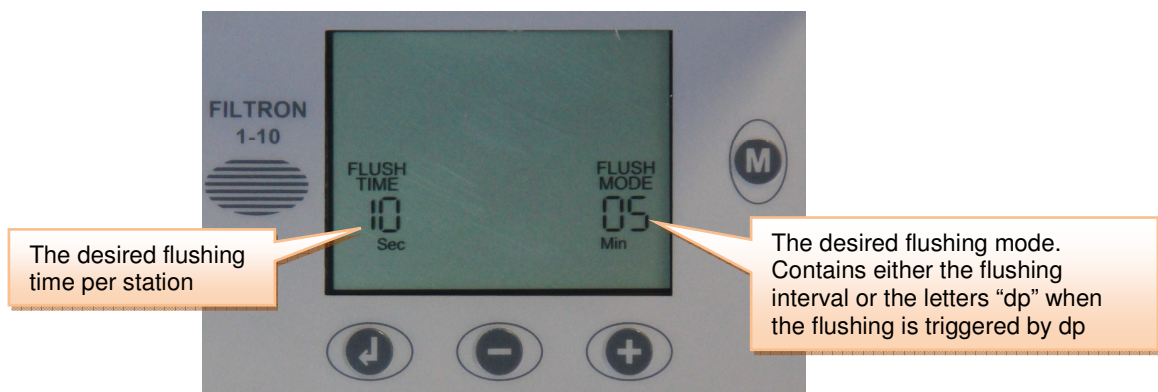
List of features

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



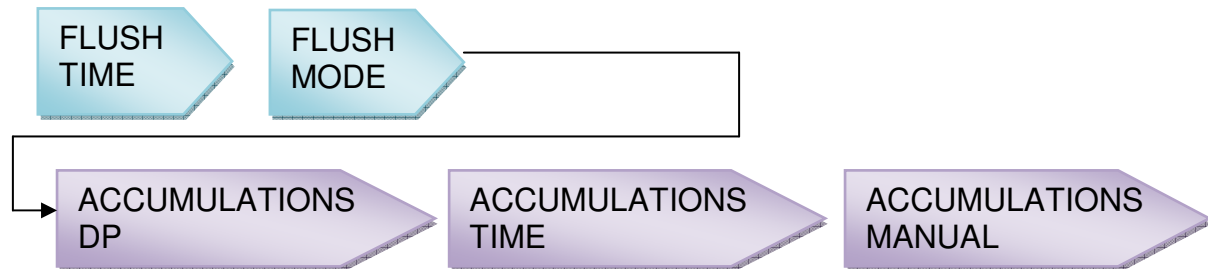
The screen consists of several fields, some of them are editable and some of them are not. For inserting EDIT MODE the ENTER key has to be pushed. The EDIT MODE is indicated by blinking of the characters at the currently editable field. Each time the ENTER key is pushed again, the next editable field 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.

REMARK

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 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

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.

REMARK

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. Flushing valves will be allocated starting from output 1 and up.
2. The last flushing 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 flushing 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 flushing valves.

If additionally a Main-Valve is defined, the first 5 outputs will be allocated for flushing valves and output No 6 for the Main-Valve. Output No 5 (of the last flushing 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 flushing valves, and once again output No 4 (of the last flushing 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 flushing 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.

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

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:	External dry contact DP sensor.
Pressure Sensor:	Dry contact pressure sensor
Operating temperature:	0-60° C.

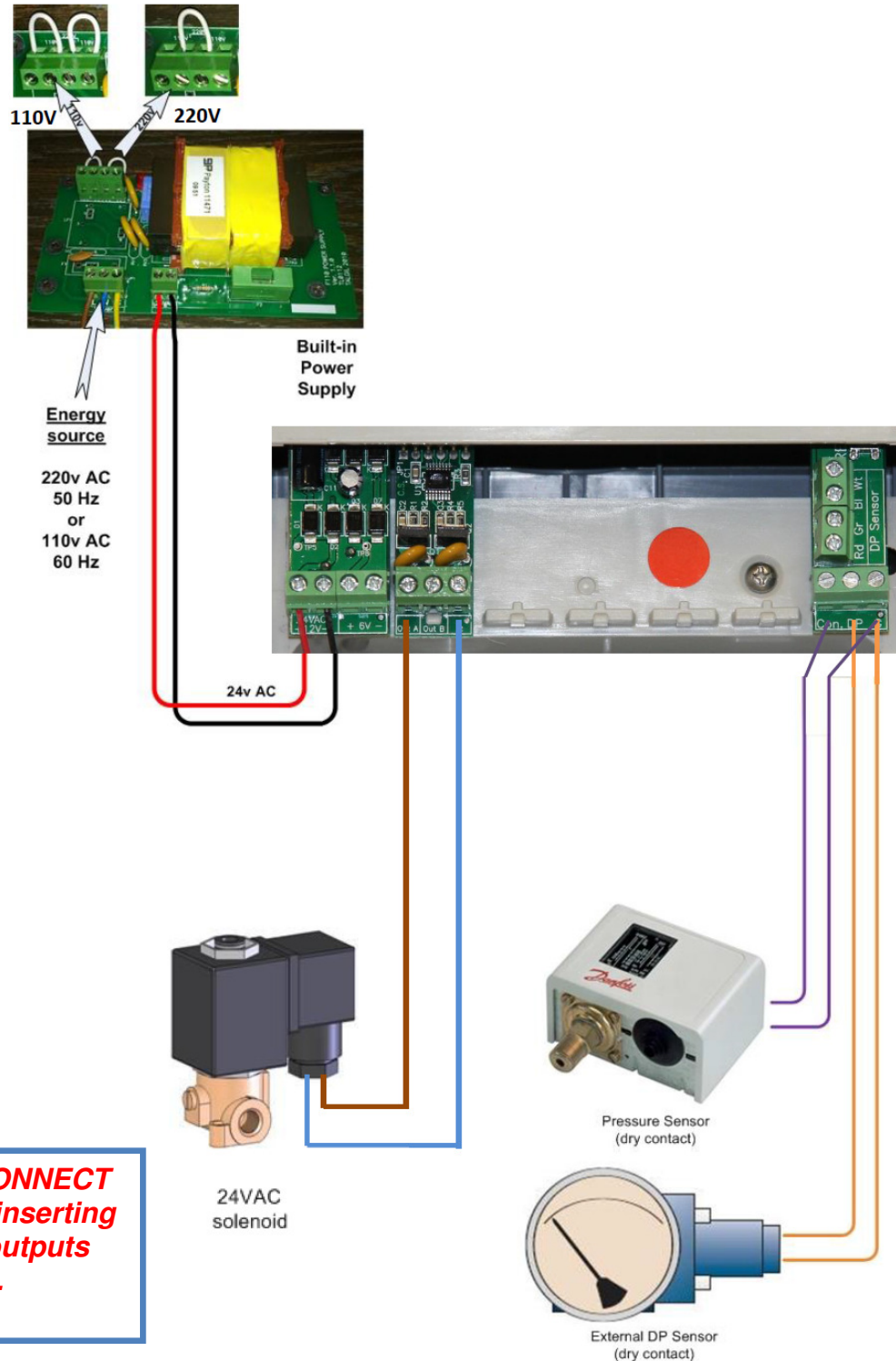
Wiring Diagram

AC MODEL

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

Notice that:

1. An External DP sensor is included.
2. The powering of the unit is by 24VAC transformed from 220/110 VAC.
3. The solenoids will be of 24VAC.



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

