



AF900 Series Electric Scanner Self-Cleaning Screen Filter

SERVICE & MAINTENANCE MANUAL

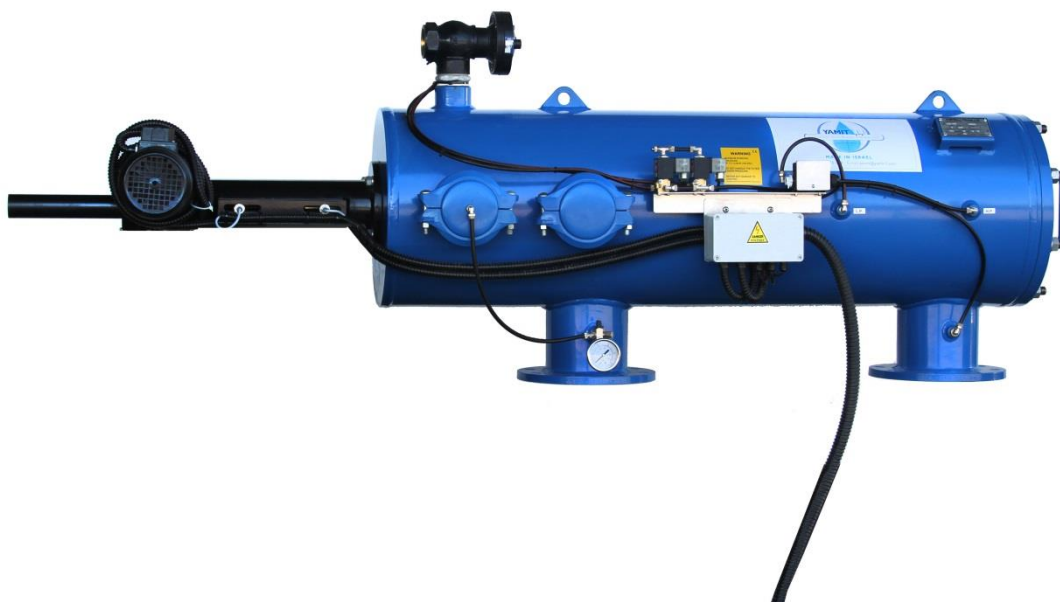


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1. Introduction

General

YAMIT Filtration & Water Treatment Ltd. (hereinafter **YAMIT**) congratulates you on purchasing the new **AF-900 SERIES** self-cleaning filter. This filter now joins the wide family of filters produced and supplied by **YAMIT** for agriculture, municipal water and sewage systems, and all types of industrial applications. All products manufactured by **YAMIT** are easy to install, use and service and don't require special skills to operate them.

For operation and maintenance of the filter please follow the instructions in this manual

2. Safety Instructions

1. It is necessary to use a noise protection device while the filter is in operation.
2. In the model with 12V DC power supply use the device which is provided by YAMIT or equivalent (with certifications and power rating).
3. Verify that the control panel is grounded. Also verify that the AC power cord is connected to the control panel through 3 x 6 A fuse protector.
4. Verify that the filter housing is grounded to the appropriate location.
5. Confirm AC power disconnection prior to service.
6. Confirm filter draining prior to service.
7. Take precautions while lifting, transporting or installing the filter.
8. Installation and operation of the filter should be performed so as to avoid direct water splashing on the control unit.
9. Confirm that filter weight, when full, meets the support construction requirements.
10. Prior to installation confirm that line pressure matches filter's operational pressure.
11. During installation, use standard flanges and connections only.
12. Check that all filter flange bolts are properly secured.
13. Please note, the filter enters a flushing mode automatically, without prior warning.
14. Use original parts only, when servicing the filter.
- 15. YAMIT cannot accept responsibility for any changes or modifications to the equipment.**

3. Description & Operation

Filter Assembly General Description (Figure 1)

The **AF-900 SERIES** self-cleaning filter enables high quality filtration from grades of 10-3000 micron from various types of fluid sources such as sewage, reservoirs, rivers, lakes, and wells.

The **AF-900 SERIES** filter contains the following parts:

- | | |
|-----------------------------|-----------------------------|
| 1. Inlet | 6. Dirt collector axis |
| 2. Coarse screen | 7. Suction nozzle |
| 3. Fine screen | 8. Electric motor |
| 4. Hydraulic flushing valve | 9. Emergency flushing valve |
| 5. Flushing chamber | 10. Outlet |

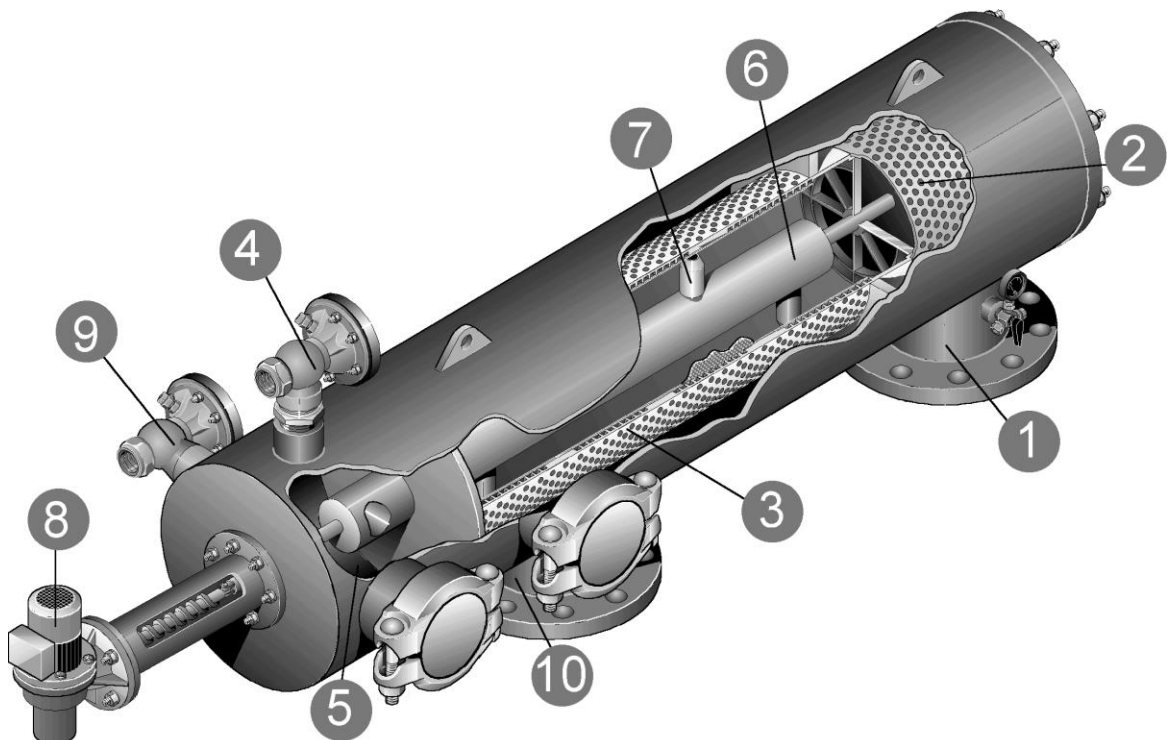


Figure 1: Filter Assembly

Filter Operation General Description (Figure 1)

Water enters the filter through an “Inlet” (1) and passes through the coarse screen (2) that functions as a “first stop” for rough particles. Water then reaches the fine screen (3), which further purifies the flow by separating smaller particles from the water. As more water flows through, impurities build up on the fine screen. As impurities on the screen accumulate, a pressure imbalance is built up between the internal section of the fine screen (3) and its external section.

Cleaning Process

When the difference in pressure (ΔP) reaches the preset value on the differential pressure indicator, a series of events is triggered while water continues to flow to the system units. The flushing valve (4) opens, and water flows outside. Pressure in the hydraulic flushing chamber (5) and the dirt collector (6) is significantly lowered resulting in a suction process via the suction nozzles (7) to the dirt collector (6) and from there through the flushing valve (4) outside. The electric motor (8) simultaneously rotates the dirt collector (6) and moves it along its axis. The combination of the linear movement and rotation efficiently cleans the entire internal screen (3) surface.

The flushing cycle continues as long as the pressure difference between the inlet and outlet remains the same and according to signals from the controller. If the pressure difference remains unchanged for a fixed preset time, the emergency flushing valve (9) opens along with the normal flushing valve (4).

The flushing cycle continues for the time that was preset on the controller. The flushing valves (9) & (4) close when the pressure difference on the pressostat drops. The operation of the electric motor is stopped after the collector axis reaches the internal or external limit switches. The filter is now ready for the next cycle, with clean and filtered water flowing through the “Outlet” (10).

4. Technical Data

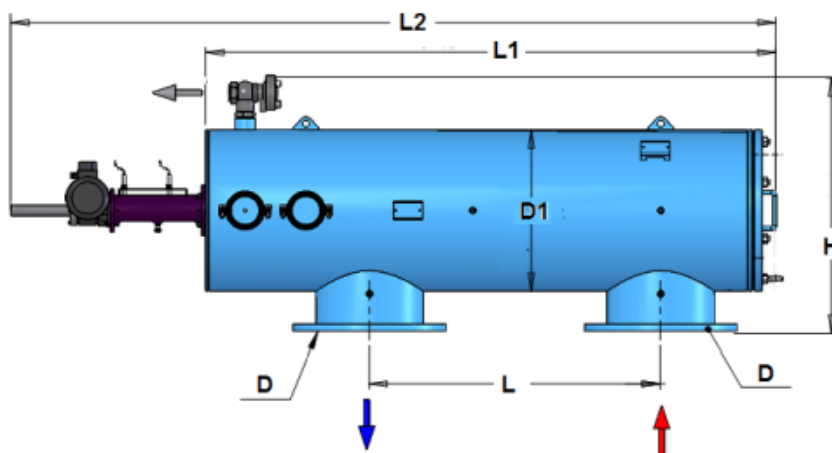
Standard Features

- Minimum operating pressure: 1 bar (15 psi)
- Maximum operating pressure: 10 bar (150 psi)
- Clean filter pressure loss: 0.1 (2 psi)
- Maximum water temperature: 65°C (149°F)
- Filtration range: 10-3000 micron
- Electric motor: 3-phase 0.5 Hp
- Control system: PLC electric control board
- Flush water consumption
(at minimum working pressure): 45 liters (12 gallons)
- Filter housing materials: carbon steel coated with baked on epoxy

Measurements & Weight

Model	In/Out D (mm) (in)		D1 (in)	H (mm) (in)		L (mm) (in)		L1 (mm) (in)		L2 (mm) (in)		Shipping Weight (kg) (lb)		Packing Volume LxWxH (m) (ft)	
AF903	75	3	10	625	24.6	450	17.7	1108	43.6	1843	72.6	187	412	2.1x0.8x0.9	7.0x2.6x2.9
AF904	100	4	10	625	24.6	600	23.6	1305	51.4	2040	80.3	203	448	2.3x0.8x0.9	7.8x2.6x2.9
AF906	150	6	16	760	29.9	750	29.5	1410	55.5	2145	84.4	330	727	2.4x0.9x1.1	8.0x2.9x3.6
AF908	200	8	18	810	31.9	750	29.5	1410	55.5	2145	84.4	378	833	2.4x0.9x1.1	8.0x2.9x3.6
AF910	250	10	18	810	31.9	900	35.4	1934	76.1	2669	105.0	435	959	2.9x0.9x1.1	9.7x2.9x3.6
AF912	300	12	18	810	31.9	1100	43.3	2182	85.9	2917	114.8	460	1014	3.1x0.9x1.1	10.4x3.0x3.6
AF914	350	14	24	965	38.0	900	35.4	1945	76.8	2680	105.5	620	1367	3.1x1.1x1.2	10.4x3.6x4.0
AF916	400	16	24	965	38.0	1100	43.3	2155	84.8	2895	113.9	670	1477	3.2x1.1x1.2	10.6x3.6x4.0
AF916X	400	16	24	900	35.4	1270	50.0	2675	105.3	3415	134.5	750	1653	3.5x1.1x1.2	11.7x3.6x4.0

**flushing flow rate data is for minimum operational pressure 1 bares (21.8 psi).



Flow Rate

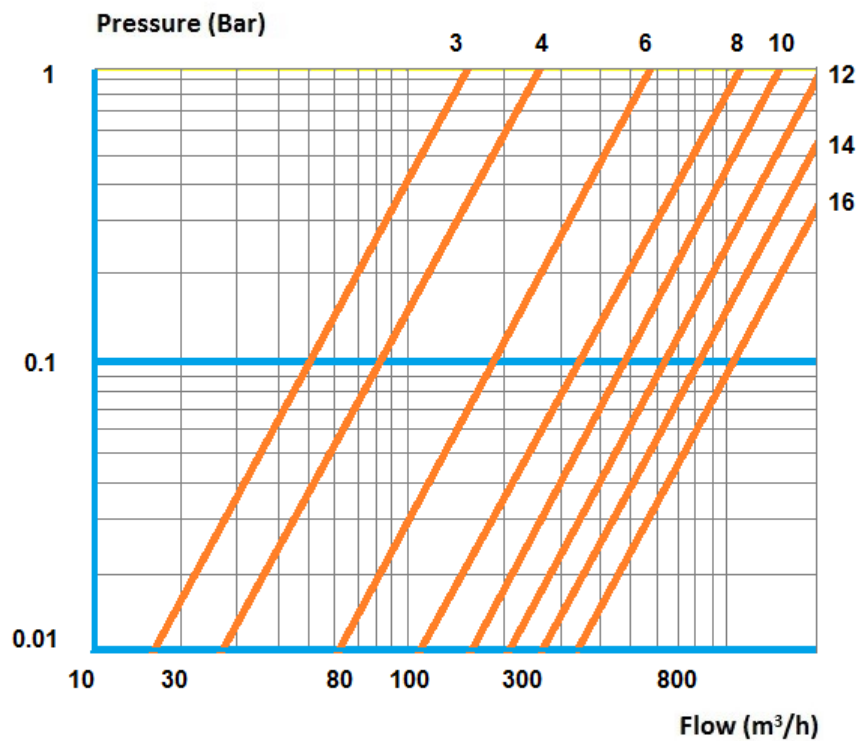
Model	Int/Outlet ØD (mm) (in)		Max. Flow Rate (m³/h) (gpm)		Screen area (cm²) (in²)		Flushing Flow rate (m³/h) (gpm)		Flushing volume (m³) (gal)	
AF903PR	80	3	50	220	3220	500	25	111	0.104	27.5
AF904PR	100	4	80	350	4500	697	25	111	0.104	27.5
AF906PR	150	6	180	793	6330	981	25	111	0.104	27.5
AF908PR	200	8	350	1540	7030	1089	25	111	0.104	27.5
AF910PR	250	10	450	2000	8970	1390	25	111	0.104	27.5
AF912PR	300	12	600	2640	10920	1692	25	111	0.104	27.5
AF914PR	350	14	850	3743	11760	1823	25	111	0.104	27.5
AF916PR	400	16	1100	4850	14310	2218	25	111	0.104	27.5
AF916XLOPR	400	16	1500	6600	17020	2638	25	111	0.104	27.5

PR = Parallel **XLOPR** – Extra long Parallel
* Flow rate data are for high quality water at filtration grade of 120 micron.
** Flushing flow rate data are for minimum operational pressure (1 bar / 15 psi).

Filtration Grade Conversion Table

Micron	10	25	30	40	50	80	100	120	150	200	400	800	1500	3000
Mesh	1500	650	550	400	300	200	150	120	100	80	40	20	10	5

Pressure Loss at 120 micron



5. Initial Installation & Operation

General

The filter assembly is protectively packed on a wood pallet with all parts assembled include the control panel (with 5 meter cable installed)

Installation

1. Remove the filter assembly from the wood pallet.
2. Install the filter assembly to the inlet line and outlet line.
3. Connect a drain pipe to the hydraulic flushing valve outlet opening (at least 50 mm diameter and 15 m long). Confirm that water runs freely out of the drain pipe.
4. Position the control panel in such a way as to be protected against humidity and solar radiation (if required longer cable than the installed 5 meter – re-connect it by authorized electrician).
5. Check that all connections are properly secured.
6. Check that all bolts and nuts on filter periphery are properly tightened and secured.

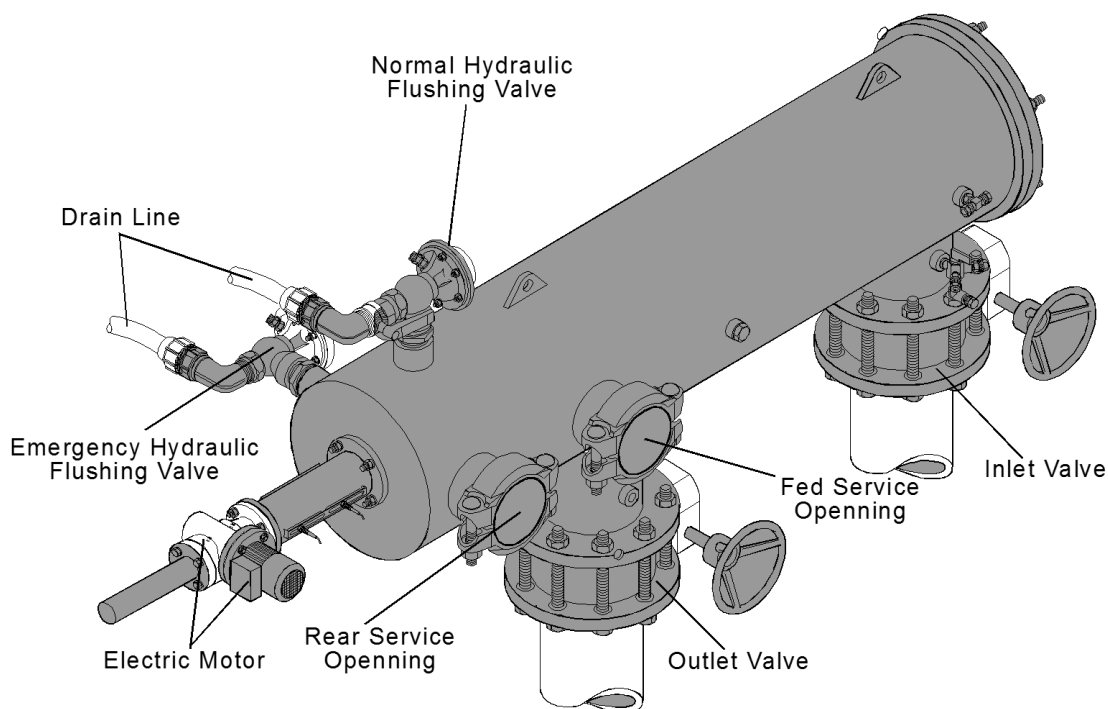


Figure 2: Initial Filter Installation

Initial Operation

1. Gradually open the inlet valve (make sure that the outlet valve, if installed, is open).
2. Check the filter assembly and its connections for leaks.
3. Perform a flushing cycle by pressing the MANUAL FLUSH switches at the control panel.
4. Verify that the hydraulic flushing valves close after 5 flushing cycles and FLUSHING lamp at the control panel extinguishes.
5. Perform a flushing cycle by disconnecting the high-pressure tube from the differential pressure indicator (closing of the electrical circuit) – re-connect it after 2 flushing cycles.
6. Verify that the normal hydraulic flushing valve keeps on flushing as long as the ΔP differential pressure indicator contacts are closed.
7. Perform an emergency flushing cycle by disconnecting the high-pressure tube from the differential pressure indicator (closing of the electrical circuit – emergency flushing will start after 5 flushing cycles of normal flushing) re-connect it after 9 flushing cycles. Verify that the hydraulic flushing valves close at the end of the flushing cycle.
8. Verify that the spiral guide performed a full travel.
9. When the filter is clean, verify that the differential pressure between inlet and outlet does not exceed 0.1 bar.
10. Set the appropriate differential pressure for flushing at the ΔP differential pressure indicator to 0.5 bar (7 psi).
11. Verify that the outlet pressure indicator reads differential pressure of at list 0.5 bar between the filter outlet and the flushing chamber.

WARNING

Take precautions while operating the filter as the filter may enter a flushing mode automatically, without prior warning.

6. Maintenance & Periodical Checks

6.1 Electric Motor Removal & Installation

1. Close the inlet and the outlet line valves.
2. **Lock** the main switch in the "0" position till after the service is performed
3. Verify that filter is drained prior to service.
4. A qualified technician will carry out the electrical connections.
5. Disconnect the electric motor from the electrical power source. Prior to removal, mark the electrical wiring connections (according to colors) on the new motor.
6. Remove the four screws holding the rear axis shield and remove the shield.
7. Remove the four nuts and washers attaching the motor assembly to the filter assembly.
8. Carefully remove the old motor assembly. Verify existence of splint on the motor axis groove.
9. Remove the splint out of the old motor axis groove.
10. Carefully slide the new motor assembly into the filter assembly.
11. Install the splint into the new motor axis groove.
12. Install the four nuts and washers attaching the motor assembly to the filter assembly.
13. Connect the electric motor to the electrical power source according to the marking previously made in step 5.
14. Set the main switch at the control panel to "1" position.
15. Open the inlet and the outlet line valves.
16. Perform a flushing cycle by pressing the MANUAL FLUSH switch at the control panel.
17. Verify that the hydraulic flushing valves close after 5 flushing cycles and FLUSHING lamp at the control panel extinguishes.
18. Check for leaks.
19. Install the rear shield with the 4 screws (see step 6).

WARNING

Take precautions while operating the filter as the filter may enter a flushing mode automatically, without prior warning.

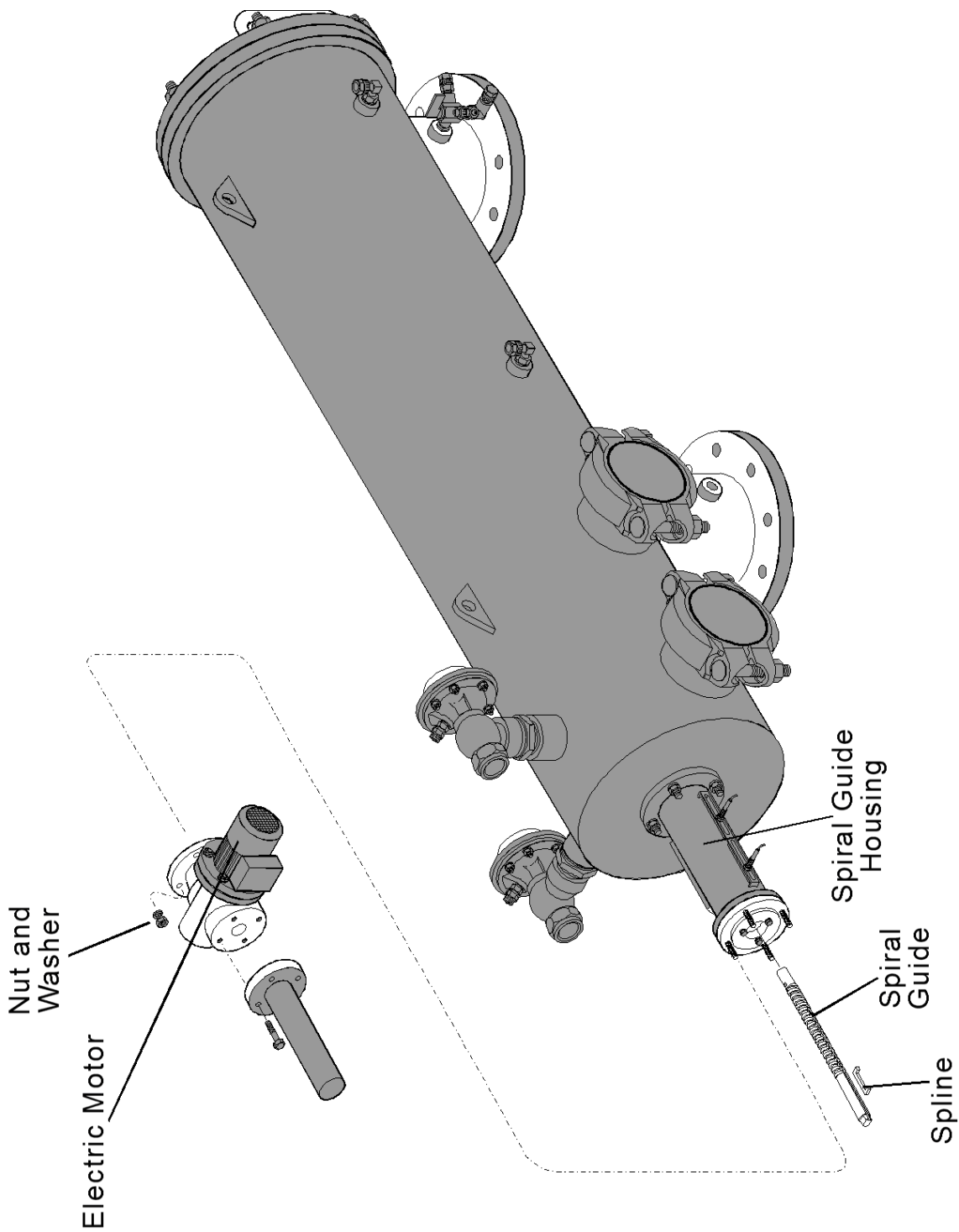


Figure 3: Electric Motor Removal & Installation

6.2 – Coarse Screen Removal & Installation

1. Close the inlet and the outlet line valves.
2. Set the main switch at the control panel to "0" position.
3. Verify that filter is drained prior to service.
4. Remove the nuts and washers attaching the cover to the filter housing.
5. Pull the forward bearing assembly out of the cover.
6. Remove the body seal from the cover groove.
7. Pull the old coarse screen out of the fine screen assembly (On 6" filters and above, the coarse screen is screwed into the fine screen assembly).
8. Slide the new coarse screen into the fine screen assembly.
9. Verify that the straight side of the body seal fits into the groove located in the cover.
10. Install the nuts and washers attaching the cover to the filter housing.
11. Insert the forward bearing assembly into the cover (Verify that the dirt collector is located inside the forward bearing assembly).
12. Set the main switch at the control panel to "1" position.
13. Open the inlet and outlet line valves.
14. Perform a flushing cycle by pressing the MANUAL FLUSH switch at the control panel.
15. Verify that the hydraulic flushing valves close after 2 minutes and FLUSHING lamp at the control panel extinguishes.
16. Check for leaks.

WARNING

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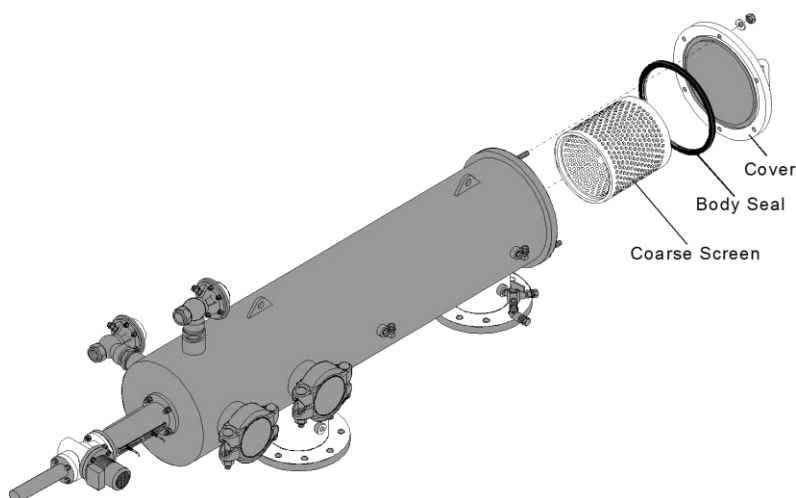


Figure 4: Coarse Screen Removal & Installation

6.3 - Fine Screen Assembly Removal & Installation

1. Close the inlet and the outlet line valves.
2. Set the main switch at the control panel to "0" position.
3. Verify that filter is drained prior to service.
4. Remove the nuts and washers attaching the cover to the filter housing.
5. Remove the body seal from the cover groove.
6. Pull the coarse screen out of the fine screen assembly.
7. Pull the fine screen assembly out of the filter housing assembly (On 6" filters and above, the coarse screen is screwed into the fine screen assembly).
8. Remove the seals from the old fine screen assembly.
9. Position both upper and lower seals into the new fine screen assembly.
10. Lubricate upper and lower seals with **silicon grease**.
11. Slide the new fine screen assembly into the filter housing assembly (verify that the dirt collector axis is in the screen bearing, located in the screen handle).
12. Slide the coarse screen into the fine screen assembly.
13. Verify that the straight side of the body seal fits into the groove located in the cover.
14. Install the nuts and washers attaching the cover to the filter housing.
15. Set the main switch at the control panel to "1" position.
16. Open the inlet and outlet line valves.
17. Perform a flushing cycle by pressing the MANUAL FLUSH switch at the control panel.
18. Verify that the hydraulic flushing valves close after 5 flushing cycle and FLUSHING lamp at the control panel extinguishes.
19. Check for leaks

WARNING

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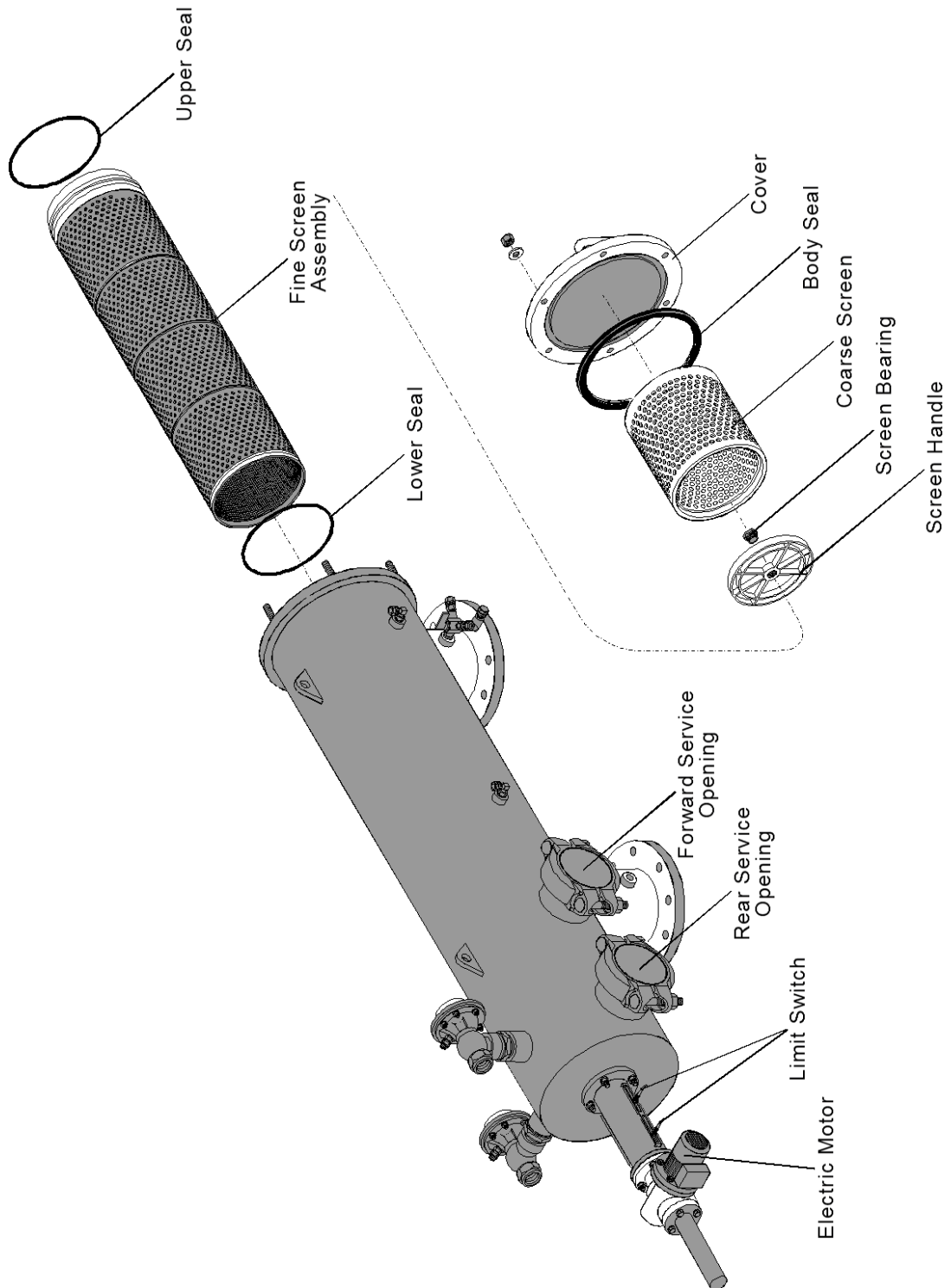


Figure 5: Fine Screen Removal & Installation

6.4 - Dirt Collector Removal & Installation

1. Close the inlet and the outlet line valves.
2. Set the main switch at the control panel to "0" position.
3. Verify that filter is drained prior to service.
4. Remove the nuts and washers attaching the cover to the filter housing.
5. Remove the "victaulic" coupling of the rear service opening cover to the filter housing.
6. Pull the coarse screen out of the fine screen assembly.
7. Pull the fine screen assembly out of the filter housing assembly.
8. Through the spiral guide housing openings pull the split pin and the fixed pin from the dirt collector connecting axis.
9. Remove the defective dirt collector out of the filter housing assembly.
10. Install the new dirt collector into the filter housing assembly
11. Through the sprinkler opening install the nut and washer attaching the connecting axis to the dirt collector
12. Insert the pins previously removed in step 9.
13. Slide the fine screen assembly into the filter housing assembly verify that the dirt collector axis is in the screen bearing, located in the screen handle).
14. Slide the coarse screen into the fine screen assembly.
15. Install the "victaulic" coupling of the rear service opening cover to the filter housing.
16. Verify that the straight side of the body seal fits into the groove located in the cover.
17. Install the nuts and washers attaching the cover to the filter housing.
18. Set the main switch at the control panel to "1" position.
19. Open the inlet and outlet line valves.
20. Perform a flushing cycle by pressing the MANUAL FLUSH switch at the control panel.
21. Verify that the hydraulic flushing valves close after 5 flushing cycles and FLUSHING lamp at the control panel extinguishes.
22. Check for leaks.

WARNING

Take precautions while operating the filter as the filter may enter a flushing mode automatically, without prior warning.

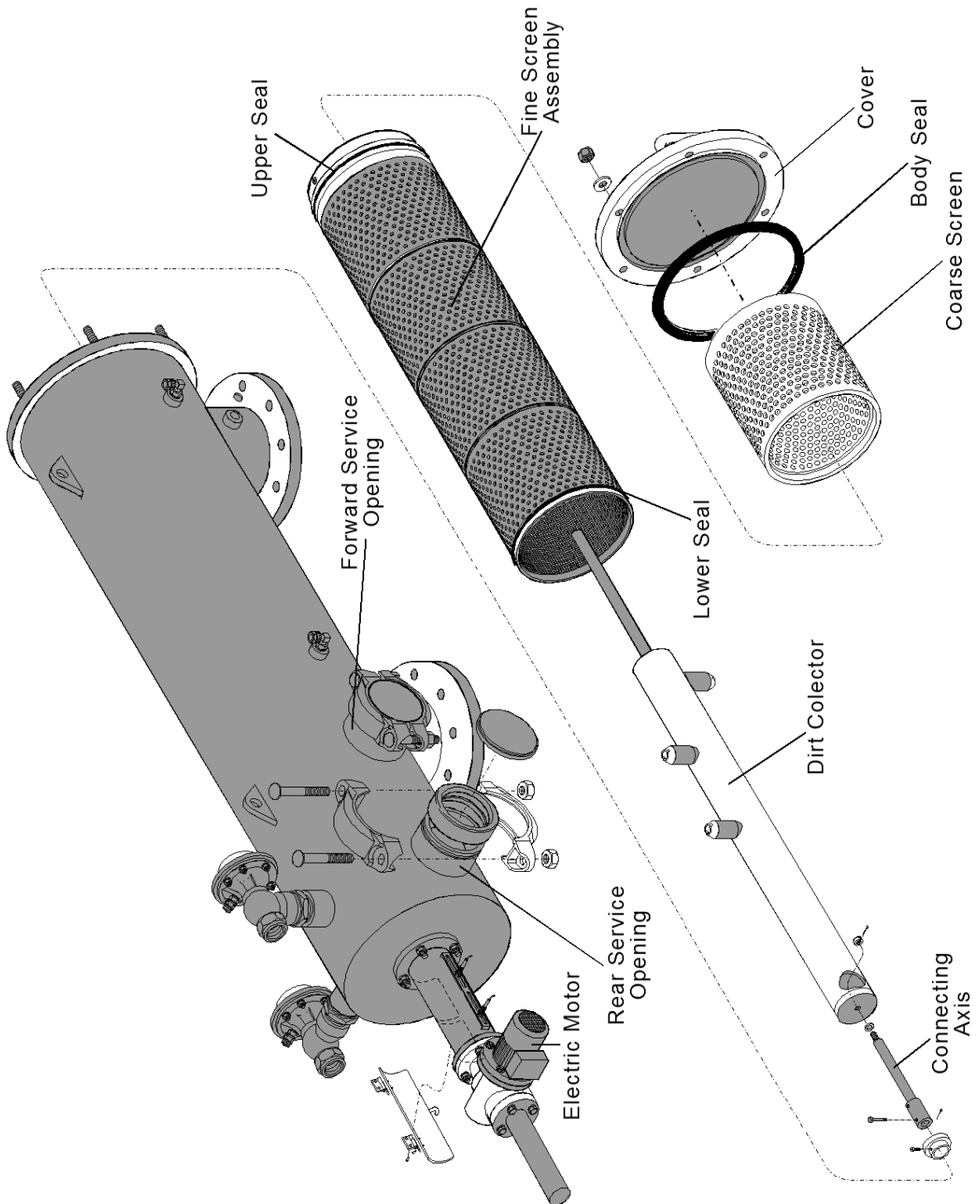


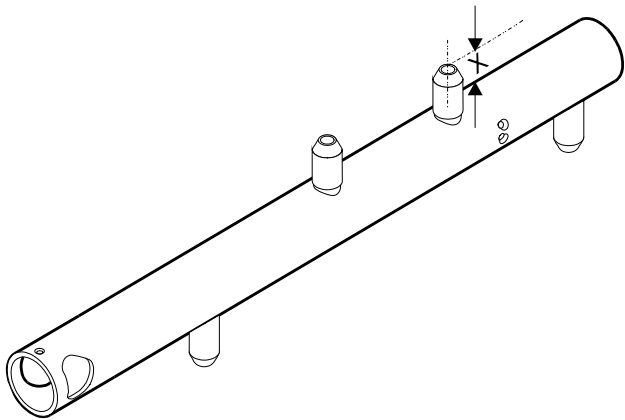
Figure 6: Dirt Collector Removal & Installation

6.5 - Periodical Checks

Perform yearly Periodical Checks at the beginning of the season, according to the following instructions:

- 1. Check the condition of the coarse screen. If defective, replace according to "**Coarse Screen Removal & Installation**".
- 2. Check the condition of the fine screen assembly. If defective, replace according to "**Fine Screen Assembly Removal & Installation**".
- 3. Check seals condition. Lubricate with **silicon grease**.
- 4. Remove the dirt collector according to "**Dirt Collector Removal & Installation**" and check the dirt collector suction nozzles height (see table). If defective, screw out the nozzle and replace with a new one.
- 5. Check existence of grease on the spiral guide.
- 6. Check the filter housing for paint damage and corrosion. If required, clean area with sandpaper and apply a thin layer of basic + epoxy paint.
- 7. Check for leaks.

Dirt Collector Suction Nozzles Height Table



<u>Type Number</u>	<u>X (Nozzle Height)</u>
AF 903-4	71 mm
AF 906	98 mm
AF 908-12	113 mm
AF914-16	158 mm

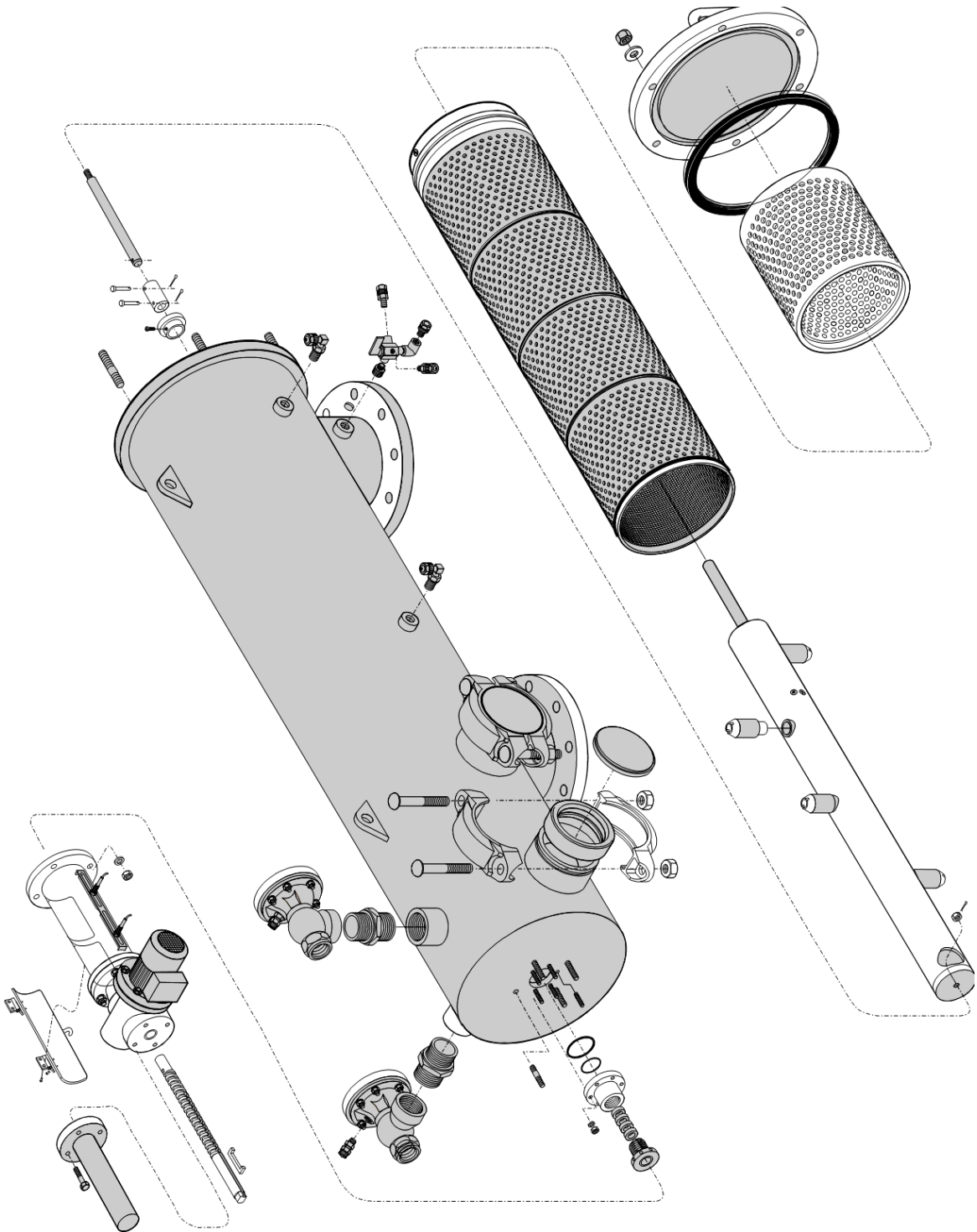
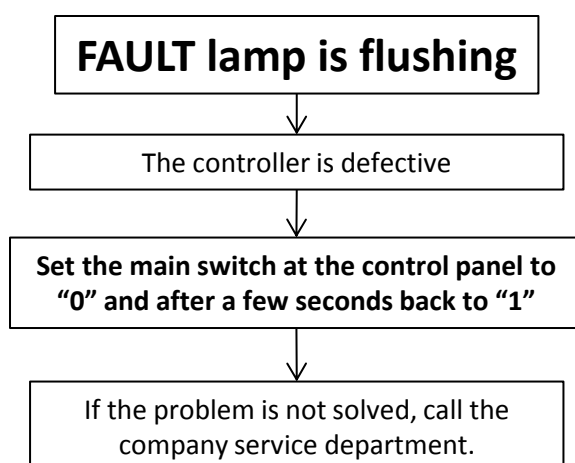
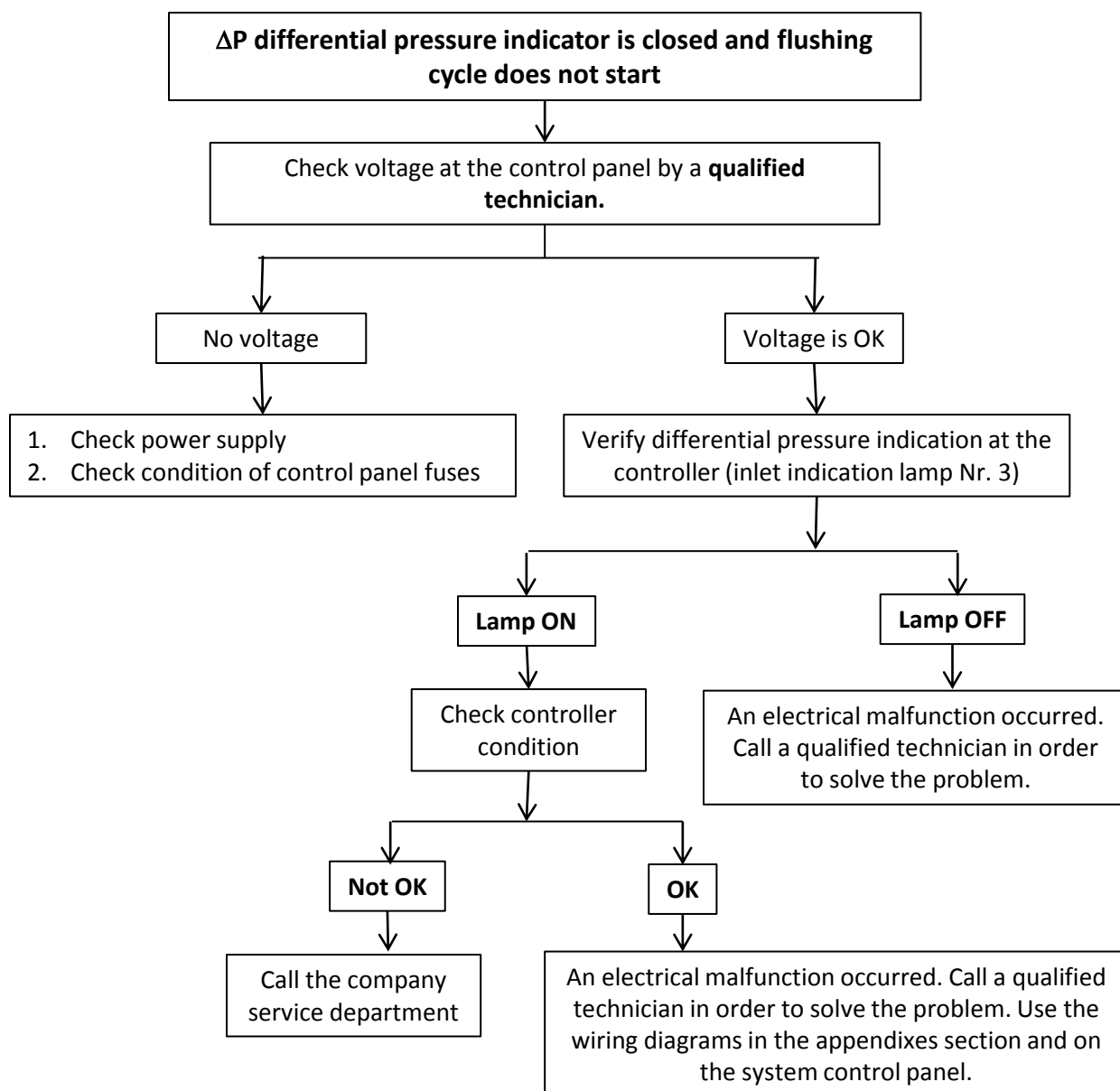
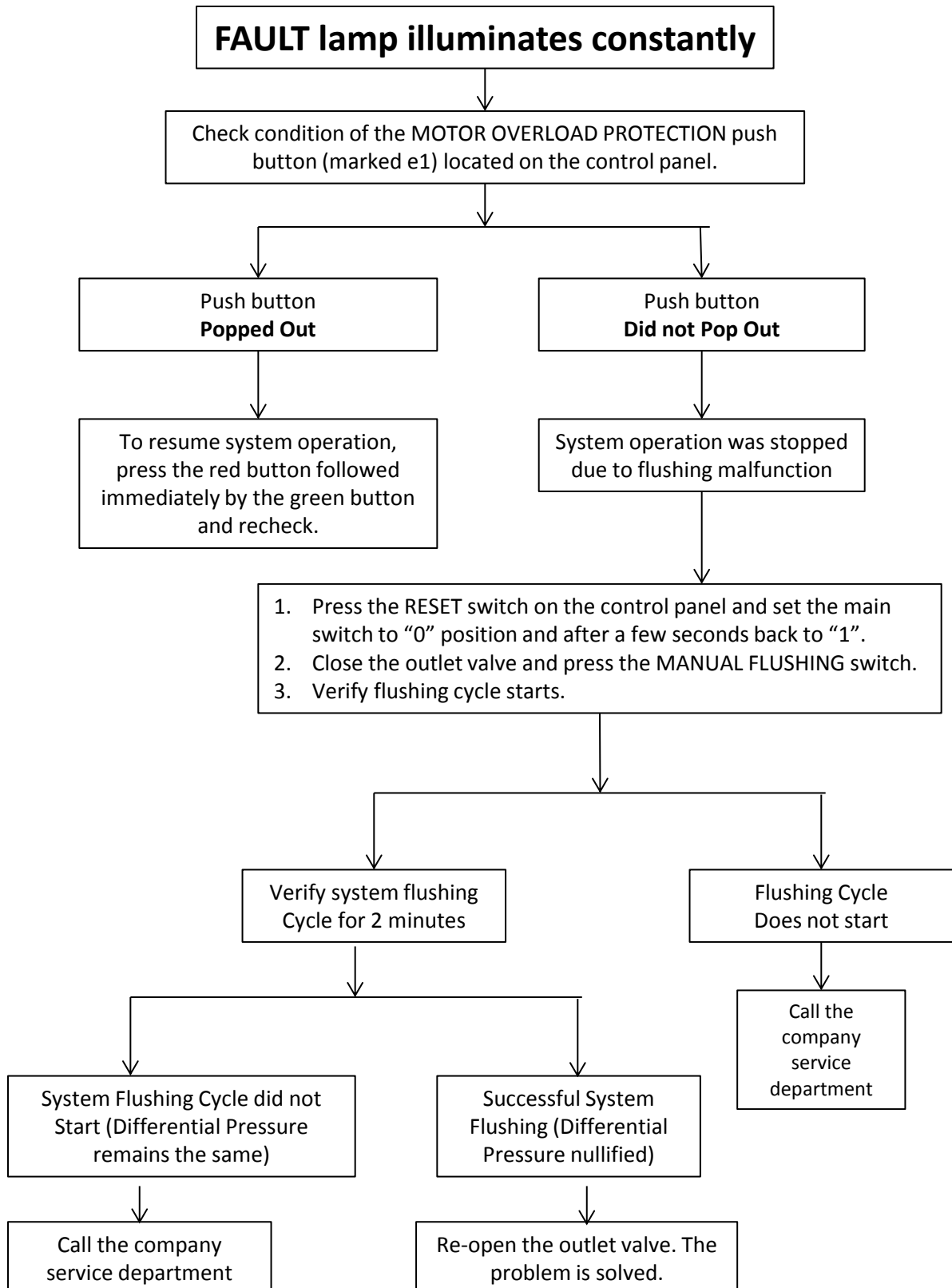


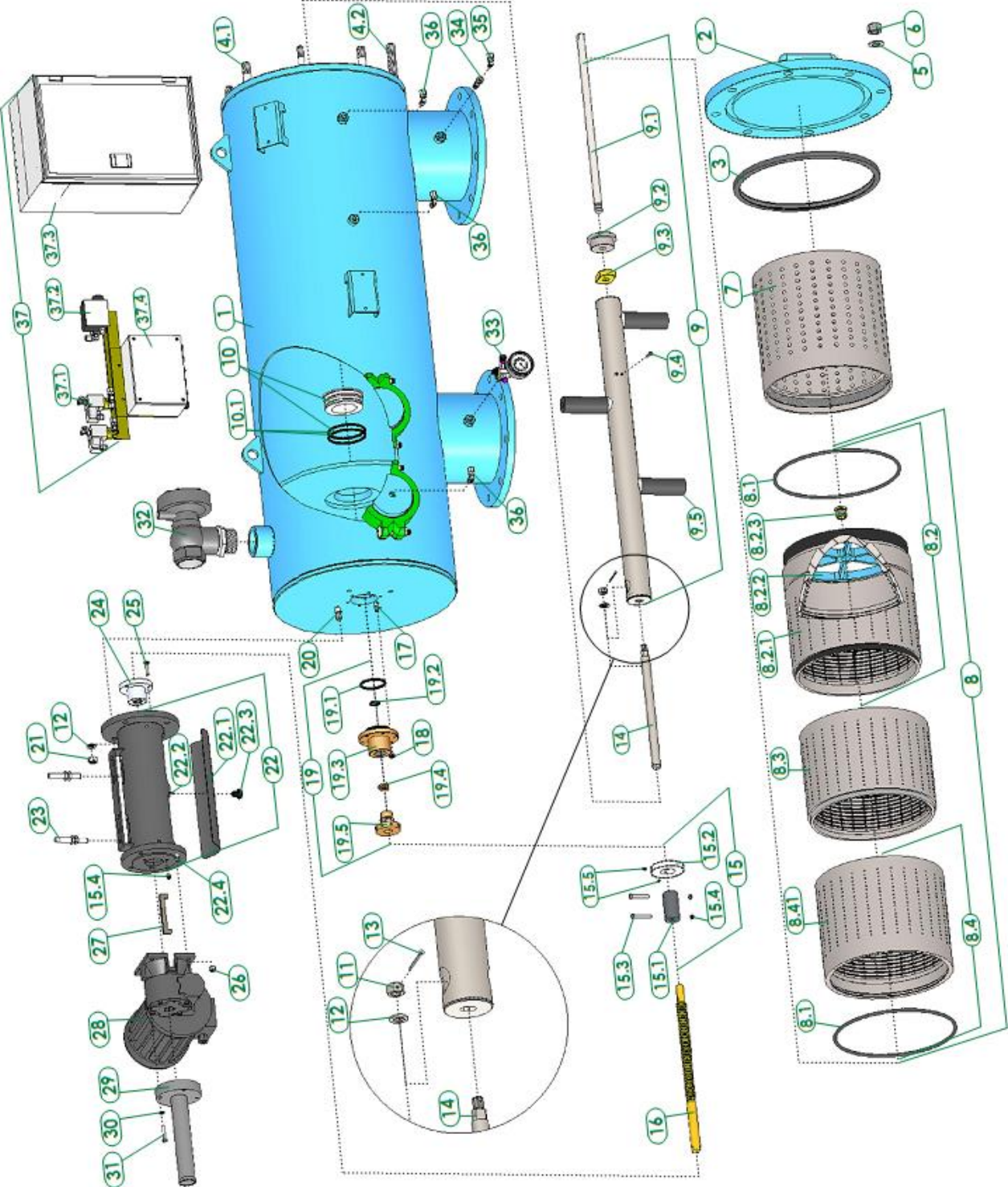
Figure 7: Periodical Checks

7. Troubleshooting





8. IPB



IPB	Filters	Catalog No	Description
1	AF900	N/A	FILTER BODY
2	AF900	N/A	FILTER COVER
3	AF903R	5311250100	U-RING FOR COVER 10"-14"
	AF904R		
	AF906R	5311400100	U-RING FOR COVER 16"
	AF908R	5311450100	U-RING FOR COVER 18"
	AF910R		
	AF912R		
	AF914R	5311600100	U-RING FOR COVER 24"
	AF916R		
	AF916X		
4.1	AF903R	5292143001-048	STUD 1/2"NC*48 SS304
	AF904R		
	AF906R	5292183001-073	STUD 3/4"NC*73 SS304
	AF908R		
	AF910R		
	AF912R	5292183001-080	STUD 3/4"NC*80 SS304
	AF914R		
	AF916R		
	AF916X		
4.2	AF906R	5292183001-130	STUD 3/4"NC*130 SS304
	AF908R		
	AF910R		
	AF912R		
	AF914R		
	AF916R		
	AF916X		
5	AF903R	4121123001	WASHER M12 SS304
	AF904R		
	AF906R	4121203001	WASHER M20 SS304
	AF908R		
	AF910R		
	AF912R		
	AF914R		
	AF916R		
	AF916X		
6	AF903R	4112140401	NUT 1/2"NC HOT GALVANIZED
	AF904R		
	AF906R	4112180401	NUT 3/4"NC HOT GALVANIZED
	AF908R		
	AF910R		
	AF912R		
	AF914R		
	AF916R		
	AF916X		

IPB	Filters	Catalog No	Description
7	AF903R	E7005600100-01	COARSE SCREEN PVC225 AF803L/4L/4X/N/903/4
	AF904R		
	AF906R	E7006600100-01	COARSE SCREEN PVC280 AF906R
	AF908R	E7007600100-01	COARSE SCREEN PVC315 AF908R
	AF910R	E7007600200-01	COARSE SCREEN PVC315 AF910R/12R
	AF912R		
	AF914R	E7008600200-01	COARSE SCREEN PVC400 AF914R/16R
	AF916R		
	AF916X	E7008600300-02	COARSE SCREEN PVC400 AF916X
	AF903R	E7005602006-01##	COMP FINE SCREEN PVC225 AF903R
	AF904R	E7005603004-02##	COMP FINE SCREEN PVC225 AF904R
	AF906R	E7006603002-01##	COMP FINE SCREEN PVC280 AF906R
	AF908R	E7007603001-01##	COMP FINE SCREEN PVC315 AF908R
	AF910R	E7007604000-01##	COMP FINE SCREEN PVC315 AF910R
	AF912R	E7007605000-01##	COMP FINE SCREEN PVC315 AF912R
	AF914R	E7008604001-01##	COMP FINE SCREEN PVC400 AF914R
8.1	AF916R	E7008605001-01##	COMP FINE SCREEN PVC400 AF916R
	AF916X	E7008606001-03##	COMP FINE SCREEN PVC400 AF916X
	AF903R	4081202100-445	O-RING 445
	AF904R		
	AF906R	4081266100-450	O-RING 450
	AF908R	4081291100-452	O-RING 452
	AF910R		
	AF912R	4081380100-459	O-RING 459
	AF914R		
	AF916R		
8.2	AF916X	E5005600102-01##-05	FINE SCREEN UPPER SECTION PVC225 ASSM AF903-4
	AF904R		
	AF906R	E5006600100-01##-03	FINE SCREEN UPPER SECTION PVC280 ASSM AF906
	AF908R	E5007600100-01##-03	FINE SCREEN UPPER SECTION PVC315 ASSM AF908-12
	AF910R		
	AF912R	E5008600100-01##-03	FINE SCREEN UPPER SECTION PVC400 ASSM AF914-16X
	AF914R		
	AF916R		
8.2.1	AF916X	E5005600102-01##-06	FINE SCREEN UPPER SECTION PVC225
	AF904R		
	AF906R	W5006600100-01##	FINE SCREEN UPPER SECTION PVC280
	AF908R	W5007600100-01##	FINE SCREEN UPPER SECTION PVC315
	AF910R		
	AF912R		
	AF914R	W5008600100-01##	FINE SCREEN UPPER SECTION PVC400
	AF916R		
	AF916X		

IPB	Filters	Catalog No	Description
8.2.2	AF903R	5021640500	SCREEN WHEEL 225 NYLON
	AF904R		
	AF906R	5021010600-P	SCREEN WHEEL 280 STEEL
	AF908R	5021010700-P	SCREEN WHEEL 315 STEEL
	AF910R		
	AF912R		
	AF914R	5021010800-P	SCREEN WHEEL 400 STEEL
	AF916R		
	AF916X		
8.2.3	AF900	5172391800	SCREEN BEARING F/DIRT COLLECTOR SHAFT AF900
8.3	AF904R	W5005600300-01##	FINE SCREEN MIDDLE SECTION PVC225
	AF906R	W5006600300-01##	FINE SCREEN MIDDLE SECTION PVC280
	AF908R	W5007600300-01##	FINE SCREEN MIDDLE SECTION PVC315
	AF910R		
	AF912R		
	AF914R	W5008600300-01##	FINE SCREEN MIDDLE SECTION PVC400
	AF916R		
	AF916X		
8.4	AF903R	E5005600201-01##-01	FINE SCREEN LOWER SECTION PVC225 ASSM
	AF904R		
	AF906R	E5006600200-01##-01	FINE SCREEN LOWER SECTION PVC280 ASSM
	AF908R	E5007600200-01##-01	FINE SCREEN LOWER SECTION PVC315 ASSM
	AF910R		
	AF912R		
	AF914R	E5008600200-01##-01	FINE SCREEN LOWER SECTION PVC400 ASSM
	AF916R		
	AF916X		
8.4.1	AF903R	W5005600201-01##	FINE SCREEN LOWER SECTION PVC225
	AF904R		
	AF906R	W5006600200-01##	FINE SCREEN LOWER SECTION PVC280
	AF908R	W5007600200-01##	FINE SCREEN LOWER SECTION PVC315
	AF910R		
	AF912R		
	AF914R	W5008600200-01##	FINE SCREEN LOWER SECTION PVC400
	AF916R		
	AF916X		
9	AF903R	E7103300200-01	COMP D/COLLECTOR 2" SS304 2 NOZZLE AF903
	AF904R	E7103300300-01	COMP D/COLLECTOR 2" SS304 3 NOZZLE AF904
	AF906R	E7103300301-01	COMP D/COLLECTOR 2" SS304 3 NOZZLE AF906
	AF908R	E7103300302-01	COMP D/COLLECTOR 2" SS304 3 NOZZLE AF908
	AF910R	E7103300401-01	COMP D/COLLECTOR 2" SS304 4 NOZZLE AF910
	AF912R	E7103300500-01	COMP D/COLLECTOR 2" SS304 5 NOZZLE AF912
	AF914R	E7103300402-01	COMP D/COLLECTOR 2" SS304 4 NOZZLE AF914
	AF916R	E7103300501-01	COMP D/COLLECTOR 2" SS304 5 NOZZLE AF916
	AF916X	E7103300600-01	COMP D/COLLECTOR 2" SS304 6 NOZZLE AF916X

IPB	Filters	Catalog No	Description
9.1	AF903R	5131301800	DIRT COLLECTOR SHAFT SS304 18mm AF903-8
	AF904R		
	AF906R		
	AF908R		
	AF910R	5131301801	DIRT COLLECTOR SHAFT SS304 18mm AF910-916X
	AF912R		
	AF914R		
	AF916R		
	AF916X		
9.2	AF900	5113610103	DIRT COLLECTOR 2" UPPER PLUG AF900
9.3	AF900	5113390300	DIRT COLLECTOR 2" MIDDLE PLUG AF900
9.4	AF900	4102043002-019	ATTACHMENT SCREW NC10*3/4" OVAL HEAD SS304
9.5	AF903R	5121610308	SUCTION NOZZLE AF903-4
	AF904R		
	AF906R	5121610309	SUCTION NOZZLE AF906
	AF908R	5121610310	SUCTION NOZZLE AF908-12
	AF910R		
	AF912R		
	AF914R	5121610311	SUCTION NOZZLE AF914-16X
	AF916R		
	AF916X		
10	AF903-904	E5172626001	COLLECTOR BEARING ASSM AF903-4/9803-10L
	AF906-16X	E5172626002	COLLECTOR BEARING ASSM AF906-16X/9810R-16X
10.1	AF903-904	4081066100-334	O-RING 334
	AF906-16X	4081081100-339	O-RING 339
11	AF900	4112143001-01	NUT 1/2"NC + HOLE 4mm SS304 AF900
12	AF900	4121123001	WASHER M12 SS304
13	AF900	4135020050	SPLIT PIN 2.5*50
14	AF900	5136302001	CONNECTING SHAFT SS304 AF900
15	AF900	E5204300001-01	MAGNETIC DISC HOLDER ASSM AF900
15.1	AF900	5204300001	MAGNETIC DISC HOLDER AF900
15.2	AF900	5204510001	MAGNETIC DISC AF900
15.3	AF900	4102103008-045	BOLT HEX HEAD 1/4"NC*1.3/4" SS304 PARTIALLY THR
15.4	AF900	4112103002	NYLOCK NUT 1/4"NC SS304
15.5	AF900	4101053004-025	SOCKET SET SCREW M5*25 SS304
16	AF900	5134362402	SPIRAL DRIVE SHAFT BRONZE FOR AF900
17	AF900	5292113001-029	STUD 5/16"NC*29 SS304
18	AF900	4112113901	NUT 5/16"NC BRASS
19	AF900	E5182392000-01	COMP SEALING ROPE HOUSING -BRASS AF900
19.1	AF900	4081056100-331	O-RING 331
19.2	AF900	4082020100	U-RING 20*28*5,5
19.3	AF900	5182392000	SEALING ROPE HOUSING-BRASS AF900
19.4	AF900	5319000900	SEALING ROPE
19.5	AF900	5181392000	TIGHTENING NUT FOR SEALING ROPE-BRASS AF900

IPB	Filters	Catalog No	Description
20	AF900	5292143001-043	STUD 1/2"NC*43 SS304
21	AF900	4112140401	NUT 1/2"NC HOT GALVANIZED
22	AF900	E5201010001-01	MOTOR ADAPTER AF900
22.1	AF900	5201010002	MOTOR ADAPTER COVER AF900
22.2	AF900	4101053001-015	BOLT HEX HEAD M6*15 SS304
23.3	AF900	4111063003	KNOB NUT M6 PLASTIC
22.4	AF900	4102123004-030	SOCKET SET SCREW 3/8"NC*1.1/4" SS304
23	AF900	8500235700	LIMIT SWITCH FOR AF900
24	AF900	6153101001	SPIRAL DRIVE NUT SS304 AF900
25	AF900	4102103008-032	BOLT HEX HEAD 1/4"NC*1.1/4" SS304
26	AF900	4112123001	NUT 3/8"NC SS304
27	AF900	5203300800	GEAR KEY SS304 AF900
28	AF900	E4060504300	MOTOR 3 PHASE 0.5Hp 1500rpm 1:43 AF900
29	AF900	W5331610001-01	PROTECTION COVER PVC F/SPIRAL DRIVE SHAFT AF900
30	AF900	4121063001	WASHER M6 SS304
31	AF900	4101063001-040	BOLT HEX HEAD M6*40 SS304
32	AF900	E4510020003-07-1M	COMP HYDRAULIC VALVE DOROT GALIL 09AN 2"BSP
33	AF900	CS11010020	PRESSURE GAUGE SET AF900/7500/700
34	AF900	4470010001	FINGER FILTER 1/4"*1/8" STEEL
35	AF900	4650618081	MALE ELBOW 1/8"*8 STEEL
36	AF900	4650614081	MALE ELBOW 1/4"*8 STEEL
37	AF900	CSE0100232402	CONTROLLER ELI-01 COMPLETE AF900
37.1	AF900	4430131003	SOLENOID AC GEM-A BRASS 24V8W NC(2mm)
37.2	AF900	4410000004	DP PRESSURE SWITCH UNITED 24-15384
37.3	AF900	8500010000	CONTROL BOARD ELI-01 AF900
37.4	AF900	8500010800	JUNCTION BOX FOR ELI-01 CONTROLLER

9. Appendixes

9.1 Filtron ELI 01 (v. 06.2018)

A. **PANEL CONTROLS DESCRIPTION**

1. Toggle switch - Marked **MAIN**
Enable Connection the line voltage supply to the control unit.
2. Light indicator (L1 , Green) – Marked **ON** , indicates 24Vac internal supply.
3. Push-button switch (L2/S2 , Yellow) - Marked **FLUSH**.
Enable manual flushing while **FLUSH** indicator will lit during flushing cycle.
4. Push-button switch (L3 ,RED) - Marked **FAULT** .
FAULT indicator lit on system fault state.
Pressing the FAULT sw. in FAULT state will reset the control unit and resume operation.

B. **INTERNAL CONTROLS DESCRIPTION.**

PLC , Programmable logic controller. (FATEK FB's 14MA with BPEP display).

1. **TR1** , Isolated transformer with multi-voltage inlets, Which enables use of different 3 phase line Voltage supply (220-380-420-440-480V) to 150Vac/20VA fixed outlet for the PLC and 24Vac/50VA fixed outlet for the control voltage and the solenoids.
2. **OL1** , Motor over load protection 1-1.6amp. with aux. contacts.
3. **C1A/C1B** , power relays which controls filter motor movement.
4. **F1** , 1amp. Circuit breaker , serve as a main protect for the PLC & TR1.
5. **F2** , 2amp. Circuit breaker , protect against accidental short circuit on the SV1 - SV3 solenoids/outlets. (24Vac).
6. **K1** , serve as a fault auxiliary relay that activate on fault state and can drive external load (buzzer etc.) through it's Normally Open/close contacts.
7. **K2** , serve as a FLUSH auxiliary relay that activate on flush state and can drive external load (buzzer etc.) through it's Normally Open/close contacts.

C. **TERMINALS CONNECTION.**

TB 1/2/3/4	GND/R-L1/S-L2/T-L3 , 220-480Vac + GND , 3 phase , 50/60 hz. supply voltage inlets.
TB 5/6/7/8	GND/U/V/W , 220-480Vac + GND, 3 phase , 50/60 hz. motor supply voltage outlets.
TB 9/10	SV1, Regular flushing Solenoid outlets. (24VAC/10-25W)
TB 9/11	SV2 , Emergency flushing Solenoid outlets. (24VAC/10-25W)
TB 9/12	SV3 , FAULT or DOWN STREAM Solenoid outlets. (24VAC/10-25W)
TB 13/14	DP , Differential Pressure switch contacts inlets. (N.O)
TB 15/16/17	L.S.I. , Motor inner limit sensor (or switch) inlets.
TB 15/16/18	L.S.O., Motor outer limit sensor (or switch) inlets.
TB 19/20	REM , Remote control contacts inlets. (N.O) This inlet is pulse activated through voltage free external contacts with pulse duration of at least 100msec.
TB 19/21	ENA , Enable system control contacts inlets. (N.O) A short circuit at this inlets through voltage free external contacts will disable the flushing mechanism.
TB 22/23	FLUSH signal contacts outlets. (N.O)
TB 24/25	FAULT signal contacts outlets. (N.O)

terminal connection...

D. INSTALLATION.

General The control unit is supplied with 5 meters cables in flexible conduit.
The user should connect only the line supply cable through PG 13.5 gland.

Paragraph 2 & 3 are for user knowledge in case of cables extension or rewiring.

1. Connect the line supply cable (4x1-1.5mm) to the control unit terminals

IMPORTANT ! Line supply MUST be protected by 3x4 or 6 amp. Circuit breakers.

TB GND – GND wire.

TB1 - N. Natural wire.

TB2 - Live L1 phase. (Trough 4-6amp. Circuit breaker)

TB3 - Live L2 phase. (Trough 4-6amp. Circuit breaker)

TB4 - Live L3 phase. (Trough 4-6amp. Circuit breaker)

2. Connect the motor line supply cable , using 4x1-1.5mm cable, between the control unit and filter connection box Terminals

Control board

Filter Junction box

TB5 - Motor GND. Wire _____	yellow/green _____	TB5
TB6 - Motor U phase wire _____	(1) _____	TB
TB7 - Motor V phase wire _____	(2) _____	TB7
TB8 - Motor W phase wire _____	(3) _____	TB8

IMPORTANT ! Verify good connection to **MOTOR GROUND!**

Check again that the motor operating voltage connection (triangle/star) is compatible with line supply voltage applied ,and that the overload (OL1) is adjusted according to the motor nominal current consumption with the voltage applied.

installation....

3. Connect the Flushing solenoids/Differential pressure switch/Limit switches cable using 9-12 x 0.75mm cable, between control unit and filter junction box terminals.

<u>Control board</u>		<u>Filter Junction box</u>
TB9 - Solenoids common_____	(1)	TB9
TB10 - SV1 Regular flushing solenoid ,live_____	(2)	TB10
TB11 - SV2 Emergency flushing solenoid ,live _____	(3)	TB11
TB13 - differential pressure switch live._____	(4)	TB13
TB14 - differential pressure switch common_____	(6)	TB14 + TB 16
TB15 - LSI/LSO Sensors + supply wire (Brown)._____	(5)	TB15
TB16 - LSI/LSO Sensors - supply wire (Blue)._____	(6)	TB16 + TB 14
TB17 - LSI Sensor signal wire (Black). _____	(7)	TB17
TB18 - LSO Sensor signal wire (Black). _____	(8)	TB18

4. Remote & Enable inlets.

**Warning – Since remote and enable inlets are connected to the PLC inputs
Remote & Enable signals MUST BE applied through voltage free contacts.**

- A. Remote inlet** - TB 19/20 , Is pulse activated, (Min. of 250 msec. pulse Duration), and will activates the flushing mechanism only at inlet transition from OFF to ON (Short circuit).
 - B. Enable inlet** - TB 19/21 , Short circuit between this inlets will inhibit Any kind of flushing cycle.
- 5. FLUSH outlets** – TB 22/23 (Voltage free contacts). Used mainly to enable external buzzer/lamp or as a FLUSH signal to remote/main system.
- 6. FAULT outlets** – TB 24/25 (Voltage free contacts). Used mainly to enable external buzzer/lamp alarm or as a FAULT signal to remote/main system.

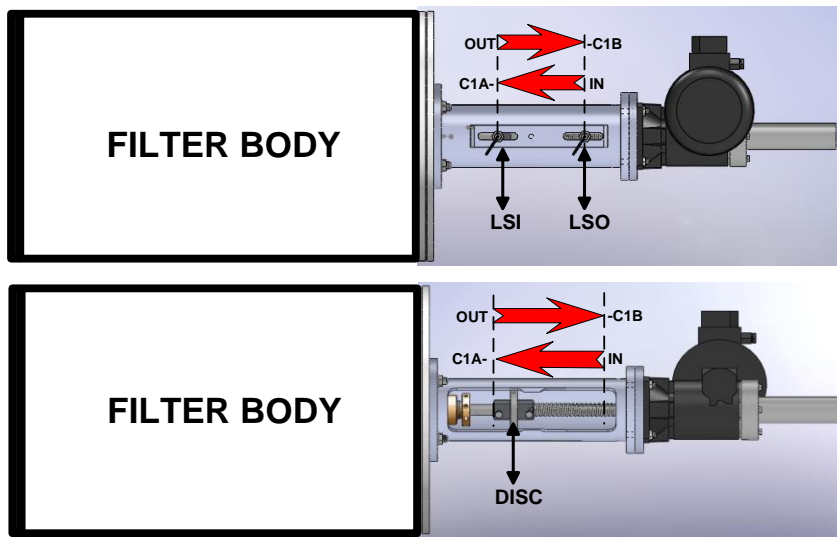
NOTE that flush and fault signals can withstand max. voltage/current 220V/2amp and **MUST BE** protected accordingly against accidental short circuit.

E. ADJUSTING MOTOR MOVEMENT.

For proper operation the motor movement must be synchronized with the power relay C1A and C1B as well as correct limit switches position.

The filter limit switches is factory set and fastened , but due to transportation, motor limit sensors can be loosened.

MOTOR MECHANISM VIEW.



Power relay marked **C1A** switch the motor to **IN** position (Until the metal disc mounted on the motor slug , reaches limit sensor **LSI** while power relay marked **C1B** switch it to **OUT** position (Until the metal disc reaches limit sensor **LSO**).

NOTE that LSO & LSI is equipped with LED mounted at the back of the sensor that illuminates in ON state.

To insure proper operation check the limit switches fastening.

1. SUPPLY LINE CHECKING.

After completing the wiring of the filter connection box to the control unit as described in chapter D. :

- 1.1 Set **MAIN** switch to **OFF** (0) position.
- 1.2 Connect the source line supply to the control unit.
- 1.3 Check existence of 3 phase voltage on the control unit supply inlets, using voltage meter between TB2 and TB3 (L1 phase) and Between TB3 and TB4 (L2 phase)
- 1.4 Avoid PLC operation during adjusting motor movement operation by switching down circuit breaker marked F2.
- 1.5 Check again that the motor operating voltage connection (triangle/star) is compatible with line supply voltage applied , and that the overload (OL1) is adjusted according to the motor nominal current consumption with the voltage applied.
- 1.6 Switch **MAIN** to **ON** position (I).

adjusting motor movement....

2. CHEKING MOTOR MOVEMENTS.

IMPORTANT!!! While operating C1A or C1B care must be taken to insure that the metal disc **WILL NOT** cross the limit sensors boundaries.

2.1 Switch **C1A /C1B momentarily** with the manual lever. (Mounted at the center of C1A / C1B)
Verify that C1A turn on the motor to IN position and C1B turn on the motor to OUT position.

IF not Switch **MAIN** switch to **OFF** (0) position , and exchange wires between two of the motor phases. (Between TB6 & TB7 or TB7 & TB8).

Switch the **MAIN** switch to **ON** (I) and check again for correct movement.

2.2 Check limit switch LSI by holding C1A manually until metal disc reaches LSI sense area and check that it's build-in LED illuminates.

- **Check that PLC INPUT indicator no. X4 also lit.**

2.3 Check limit switch LSO by holding C1B manually until metal disc reaches LSO sense area and check that it's build-in LED illuminates.

- **Check that PLC INPUT indicator no. X5 also lit.**

In case of reverse LSI/LSO signals exchange between LSI/LSO signal wires between TB17 & TB18 in the filter connection box.

2.4 In this state you can leave the motor at LSI or LSO position.

2.5 Switch on (up) circuit breaker marked **F2**.

3. SCAN TIME REGISTRATION. (Factory set while testing the filter.)

In order to register the IN / OUT time of the motor movement in the PLC execute the following :

3.1 Verify that the metal disc ,mounted on the motor slug , is in LSI or LSO Position and it's build-in LED illuminates.

3.2 Press the **FAULT** sw. until the motor activation. (For 5 sec.)

The motor is activated for two scans.

Note that if it started from LSI position it will be activated from IN to OUT and from OUT to IN. If it started from LSO position it will be activated from OUT to IN and from IN to OUT.

Now the IN and OUT scan time is registered in the PLC and will be used by the PLC mechanism as a referenced time in case of LSI/LSO malfunction.

The system is ready to operate.

F. FLUSHING PROCES

General – Motor Scan is one motor movement from IN position to OUT position (or vice versa depending on the previous motor position).

NON-DP FLUSH Is activated in three conditions :

1. Pressing momentarily the **FLUSH** switch. (Manual flush).
2. Signal received at **REMOTE** inlet. (At signal transition from OFF to ON)
3. Flush by time base according to the internal INTERVAL Timer.
(Interval time , Set by screen no. 1.0.0)
Note that entering 0 Min. will disable flush by time base.

In this conditions the control unit will execute a **flush cycle** according to the following steps :

- a. SV1 is activated. (First/one flushing valve open).
- b. After preset time (Pre-flush time , Set by screen no. 1.0.1) the motor is activated for a preset no. of scans as set on each condition scans. (Set by screens no. 1.1.0/1.1.1/1.1.2)
- c. When motor scan/s completed the motor and SV1 is turned off.

DP FLUSH

A DP flush is caused by a differential pressure across the filter's system signal at DP inlet for preset time (**DP ON TM** , Set by screen no. 1.0.2) will activates the DP FLUSH mechanism. In this condition, absence of DP signal for preset time (**DP OFF TM**, set by screen no. 1.0.3) deactivates the DP FLUSH Mechanism. This internal ON/OFF delay timers assure that accidental DP switch vibrating will not activates the flushing mechanism.

Once a DP flush signal is registered , the control unit will executes a **REGULAR FLUSH** state as follows :

- a. SV1 is activated. (First/one flushing valve open).
 - b. After preset time (Pre-flush time , Set by screen no. 1.0.1) the motor is activated for a preset no. of scans as set **DP REG. SCANS** (Set by screen no. 1.1.3)
 - c. The DP signals is checked constantly
- If the DP signal is removed during the motor scan then the flushing cycle will finish it's scan and motor and SV1 will be turned off .
 - If the DP signal is continued after the first motor scan the motor will executes a second scan and so on.
 - If after x **REGULAR FLUSH SCANS** the DP signal is not removed then the control unit will enter to **EMERGENCY FLUSH** state by turning on the SV2 solenoid (In addition to SV1 , Both flushing valves opened) and for another x **EMERGENCY FLUSH SCANS**. (Set by screen no. 1.1.4)
 - If DP signal continues in spite of x regular flush and x more emergency flush scans, which means that the flushing mechanism is unable to overcome the differential pressure across the filter/s system then **DP FLUSH FAULT** state is declared (**FAULT** Indicator lit.) and any further flush cycles is disabled.
 - Pressing the **FAULT** sw. will reset the flushing mechanism and resume operation.

Example – 5 REG. FLUSH SCANS & 5 EME. FLUSH SCANS is set.

- If after 3 reg. flush scans the DP is removed then the system will return to normal state.
- If after 5 reg. flush scans the DP is not removed then the system will continue with **EMERGENCY FLUSH** scans.
- If after 2 emergency scan (7th scan) the DP is removed then the system will return to normal State.
- If after the 10th scan the DP is not removed then the system will enter a DP flush fault state.

CONTROL UNIT ERROR and FAULT CONDITIONS

- PLC operation - Normally, **POW** (red) indicator is lit while **RUN** (green) indicator is blinking fast. (Note that PLC operation indicators is located on the PLC front panel.)
- MOTOR FAULT. (**FAULT** indicator lit constantly.) Motor fault caused by it's overload protection, will cause immediate motor stop, at any location , while **FAULT** indicator lit constantly. (PLC inputs indicators – No. **X0** lit in case of motor over load malfunction.) In this case :
 - a) Reset the overload OL1 by turning the knob left to **O** position (Release) then back to **I** position (Up).
 - b) Reset the control unit by pressing the **FAULT** sw.
- DP FLUSH FAULT. (**FAULT** indicator lit.)
 A high differential pressure also can be seen on PLC - DP inlet No. **X3** that lit).
 In this case, pressing **FAULT** sw. will reset the system and resume operation.
 Note that since a DP still exist the flushing mechanism will execute another REGULAR FLUSH followed by EMERGENCY FLUSH scans. If a second attempt to remove the DP signal is failed then manual screen cleaning is required.
- MOTOR limit switches error.
 The flushing cycles (scans) executed by the motor movement IN and OUT limit area bordered with two limit switches. Malfunction in one or both can cause damage to the filter mechanism.

To avoid this situation the flush mechanism measure the elapsed time required to scan from LSI to LSO and vice versa.

If a signal from LSI or LSO (Due to malfunction/bad connection) is not registered after the last measured time , **FAULT** indicator will blinks , indicating that one or both limit switches malfunctioned.

In case of LSI /LSO malfunction **FAULT** indicator will blink.

Note that the control unit will continue to activate the flushing mechanism with last time / location registered by LSI or LSO.

In this case check and readjust the limit switches as described on chapter E paragraph 2 and 3.

SV3 OPERATION (factory set on FAULT configuration.)

SV3 serve two purposes according to preset configuration.

- By setting SV3 as a FAULT valve , SV3 will be activates on FAULT State.
 In this case it can be used to open a bypass valve.
- By setting SV3 as a FLUSH valve , SV3 will be activates and after preset PRE-FLUSH time the flush cycle will start.
 In this case it can be used to control a down stream valve which enables more dirt collector sucking ability therefore less time/scans required for successful flushing.
 To configure this option refer to screen no. 1.2.0

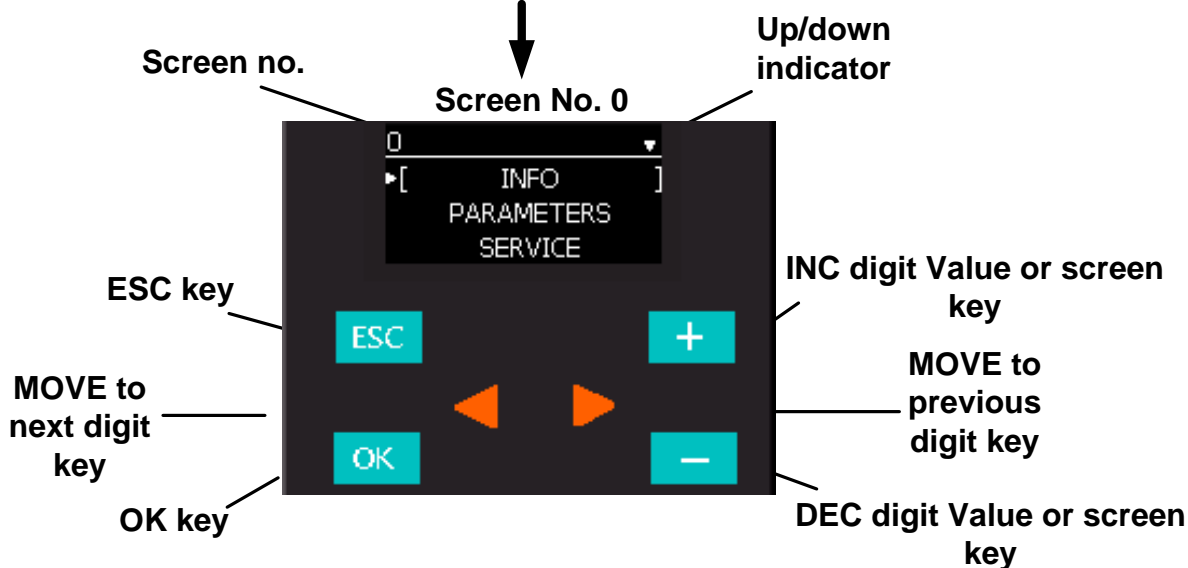
G. SYSTEM PARAMETERS SETTING VIA THE BEEP DISPLAY

The PLC is equipped with a small display which enable the user to set the system parameters as well as receiving system information such as system status / total flush cycle count / last DP flush elapsed time.

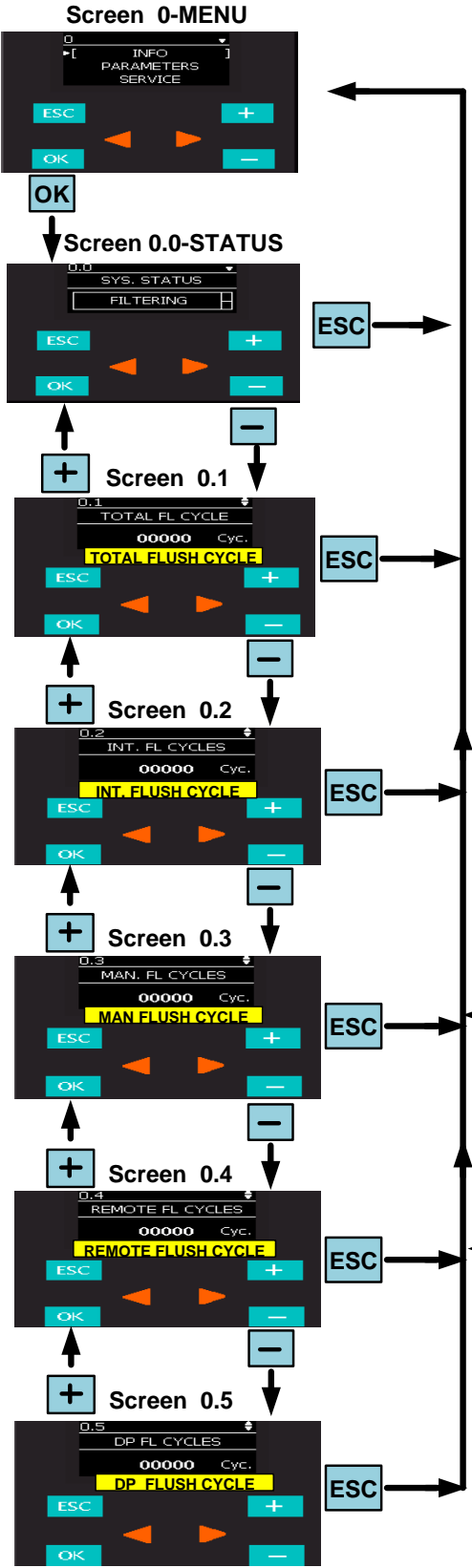
POWER UP SCREEN



AFTER 5 Sec.



1. SYSTEM INTO SCREEN



System status screen 0.0 :

- FILTERING** – The system is in filtering state.
- DP FLUSH** – The system is in flush cycle caused by DP signal.
- MANUAL FLUSH** – The system is in flush cycle caused by manual sw.
- INTERVAL FLUSH** – The system is in flush cycle caused by interval timer.
- REMOTE FLUSH** – The system is in flush cycle caused by remote signal.
- SYSTEM DISABLED** – The system is disabled via the ENA inlet.
- YSTEM DISABLED** – The system is disabled via the ENA inlet.

TOTAL FL CYC screen 0.1 :

This screen shows the current total flush cycles.
Note that the total value can be reset to 0 count by the user.
The flush cycle counter is reset to 0 automatically when reaching 32000 counts.

UPDATE VALUE ← **OK**

Use to clear the counter
(Range 1 – 32000 cycles)

TOTAL FL CYC screen 0.1 :

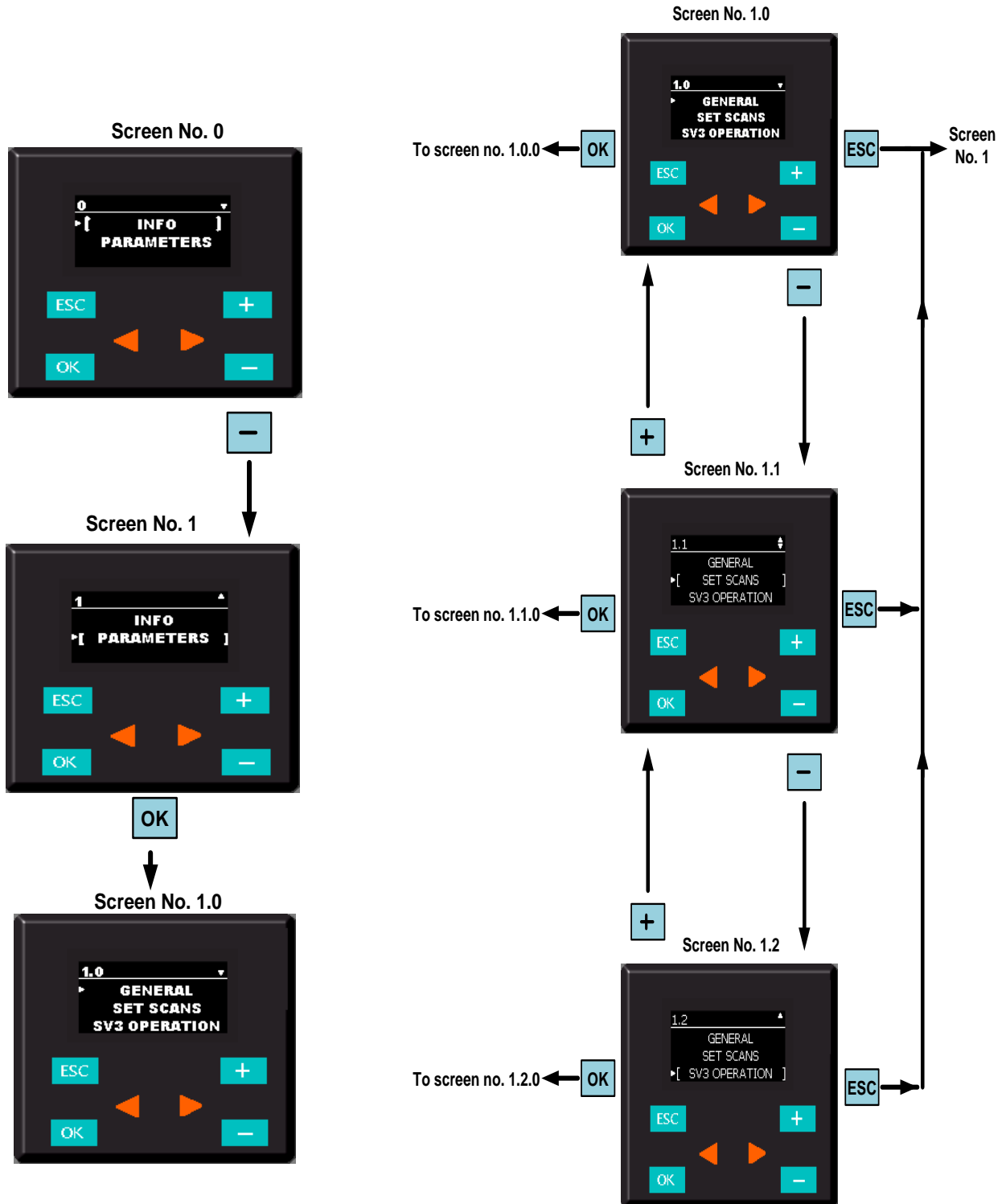
This screen shows the current total flush cycles.

LAST DP FL screen 0.7 :

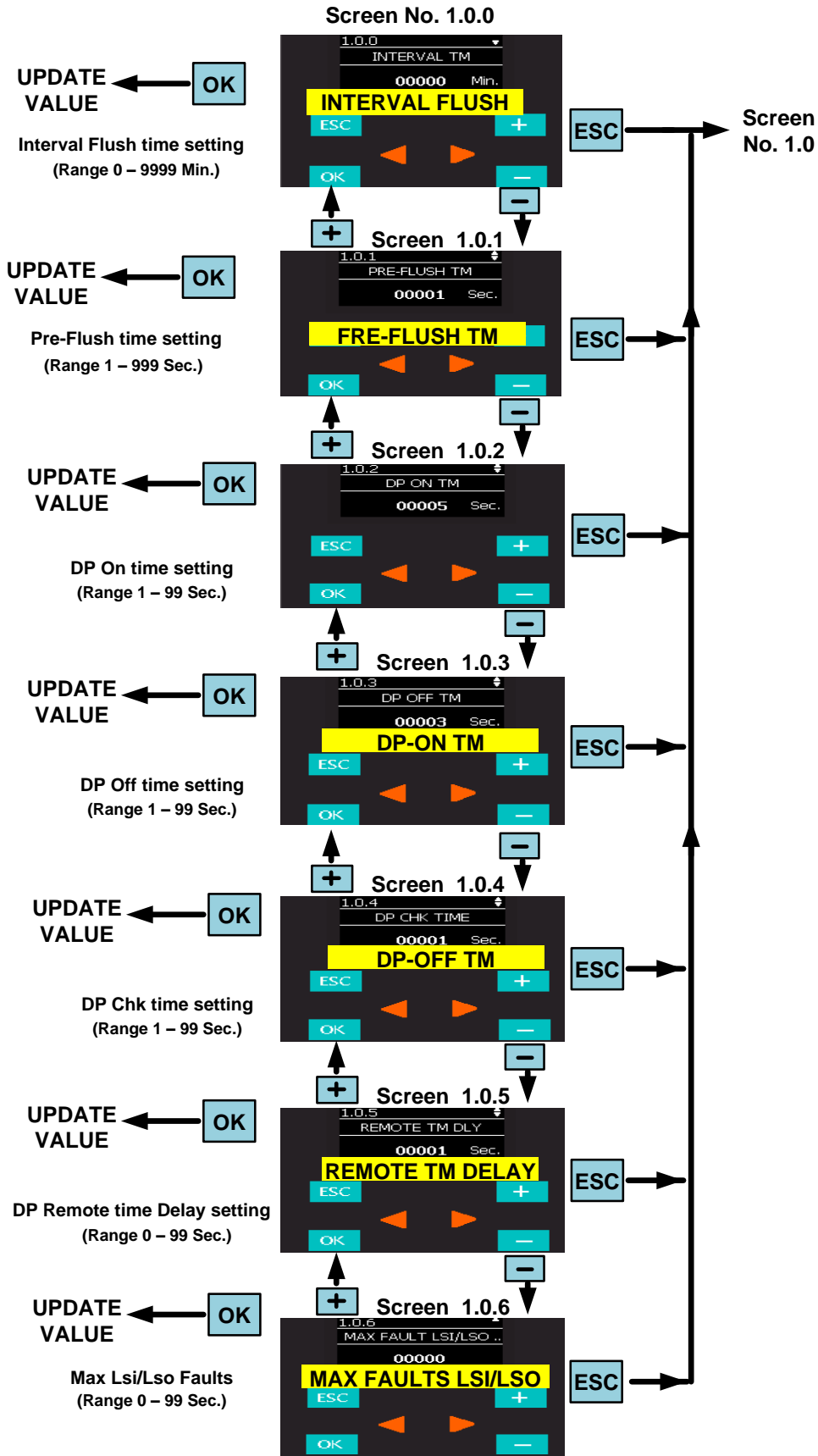
This screen shows the elapsed time (In minutes) since the last DP flush cycle only.
Note that the time counter is reset on power up or when reaching 32000 min.

2. SYSTEM PARAMETER SCREEN

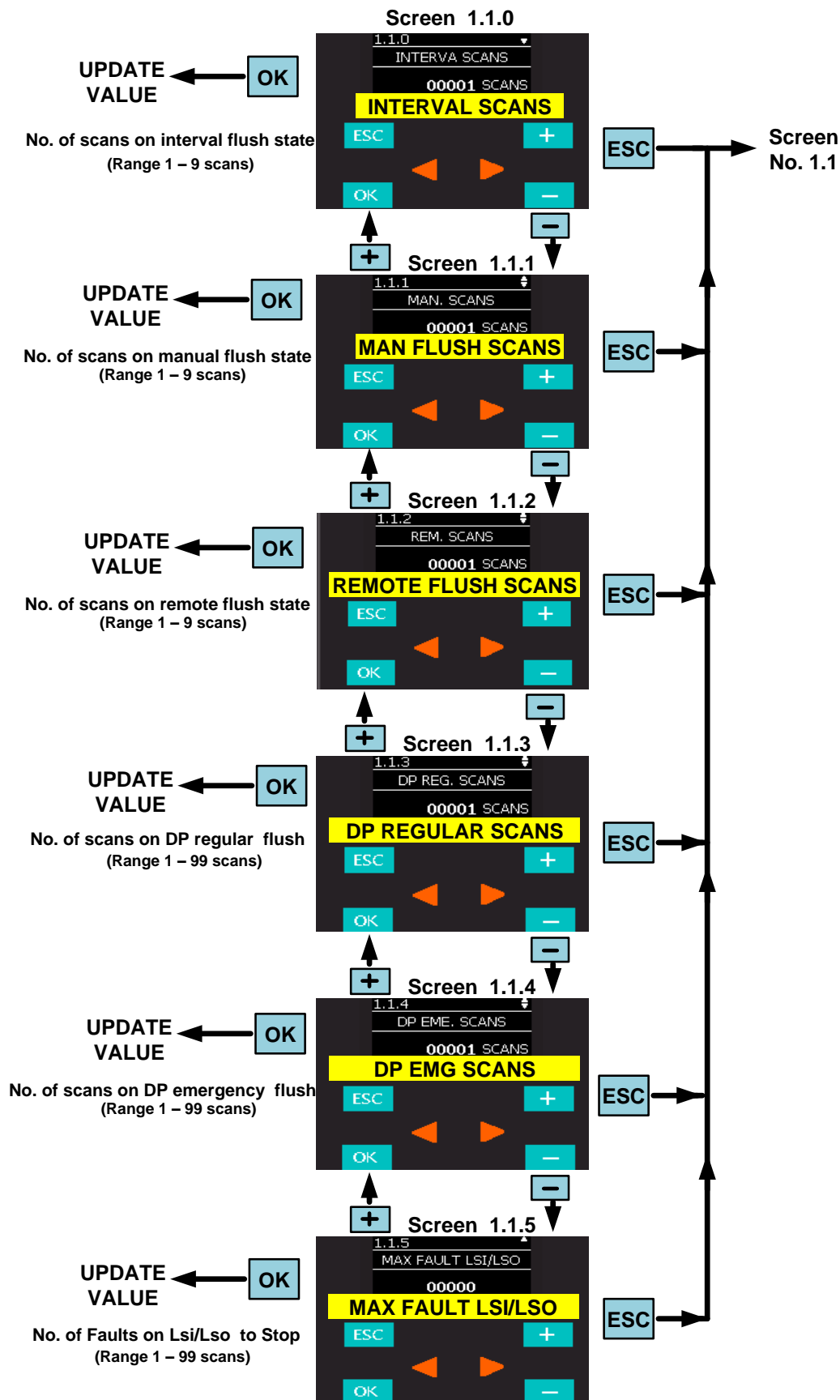
The parameters screens consist of 3 sub-screens – **GENERAL / SET SCANS / SV3 OPERATION** screens.



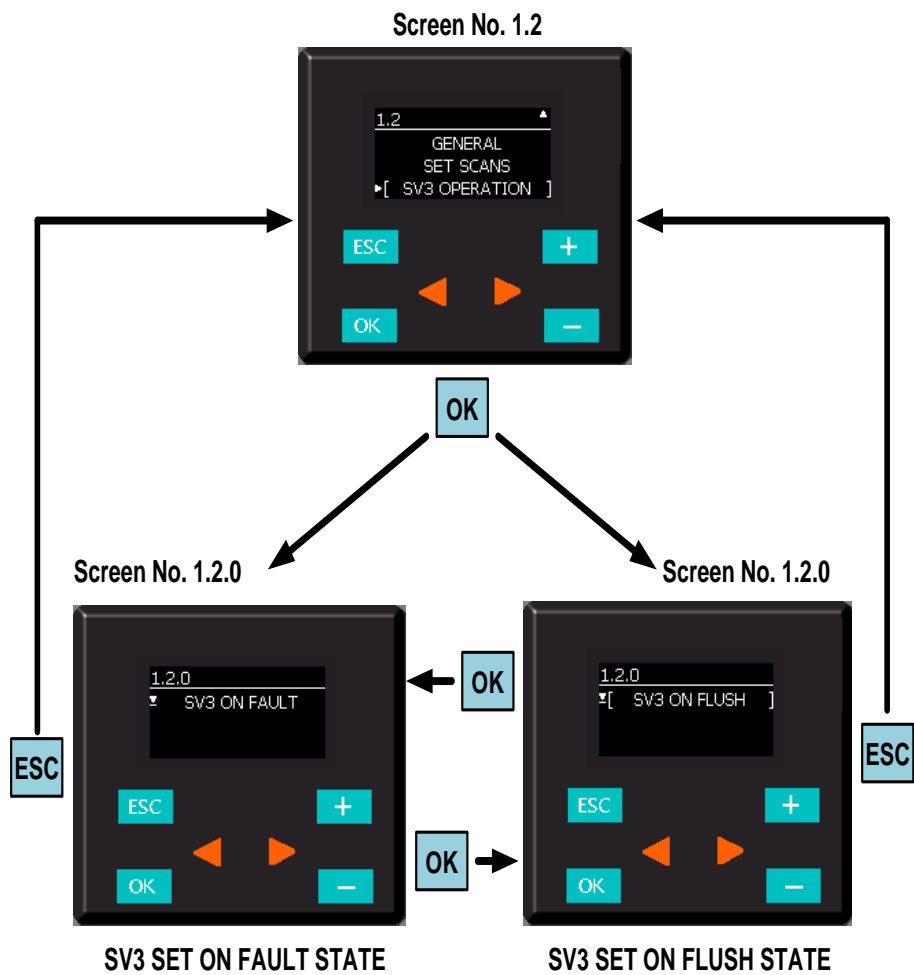
3. GENERAL SETTING SCREEN



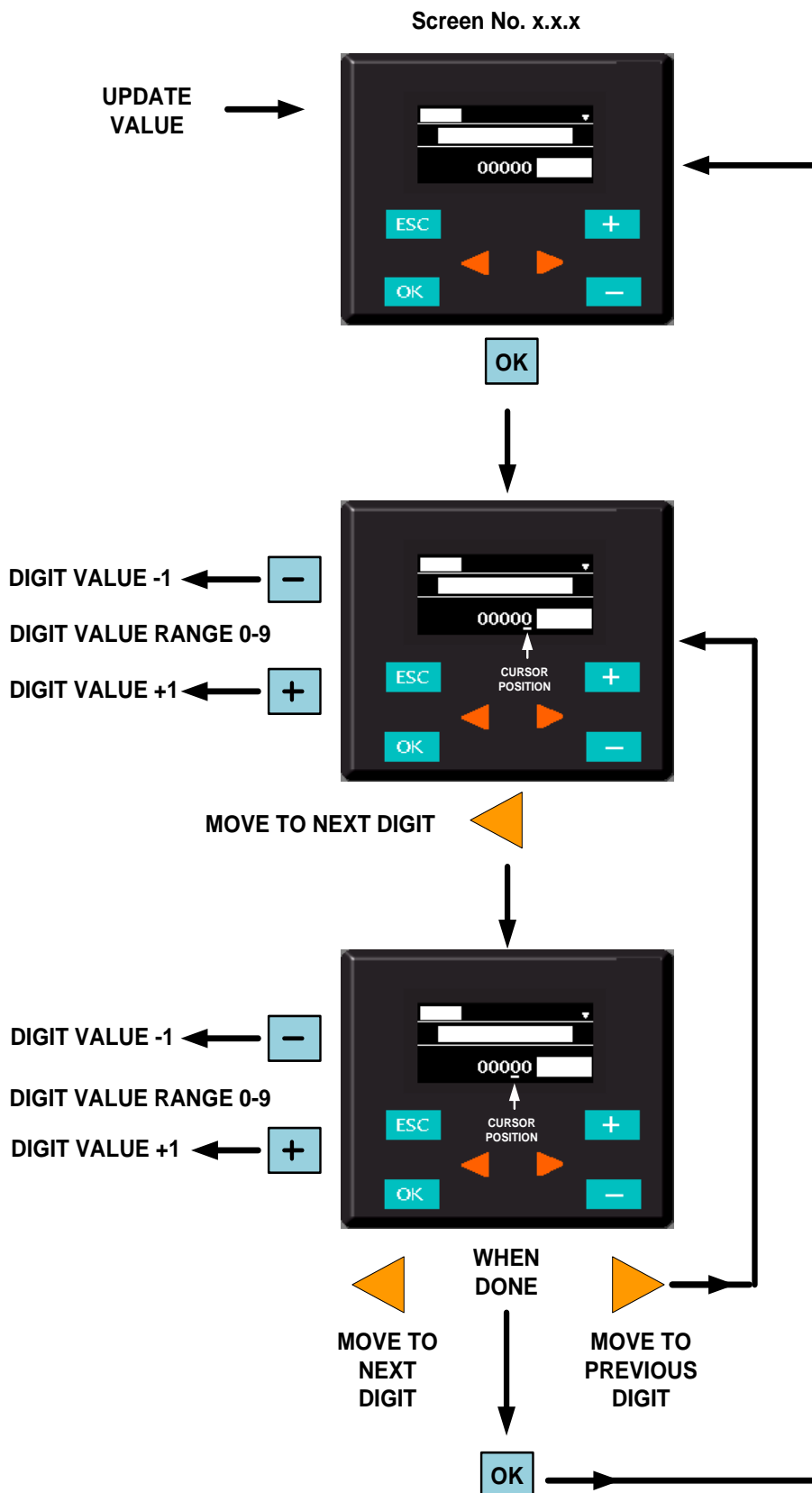
4. SET SCAN SETTING SCREEN



5. SV3 OPERATING SETTING SCREEN

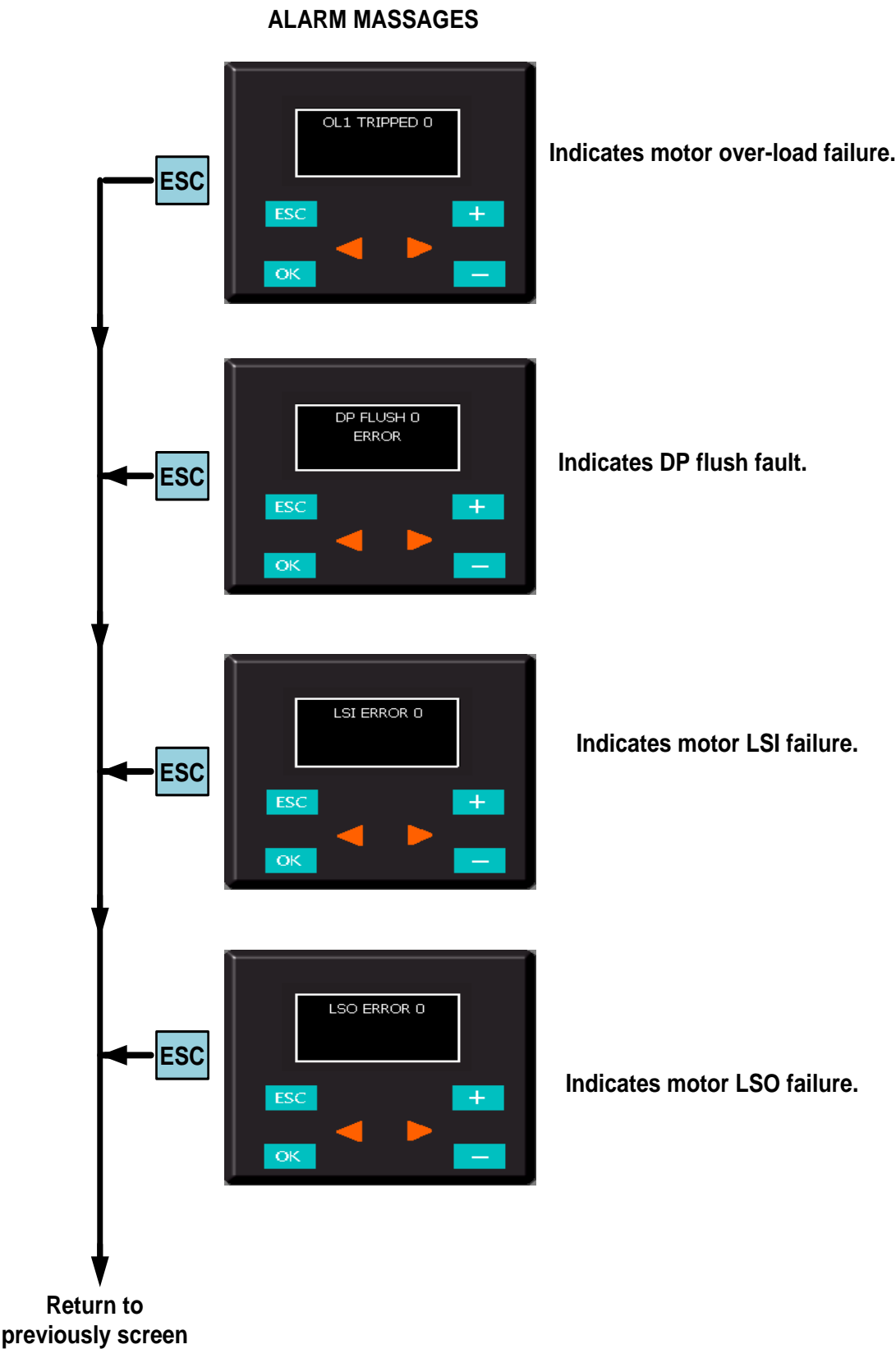


6. UPDATE/CHANGE PARAMETER VALUE

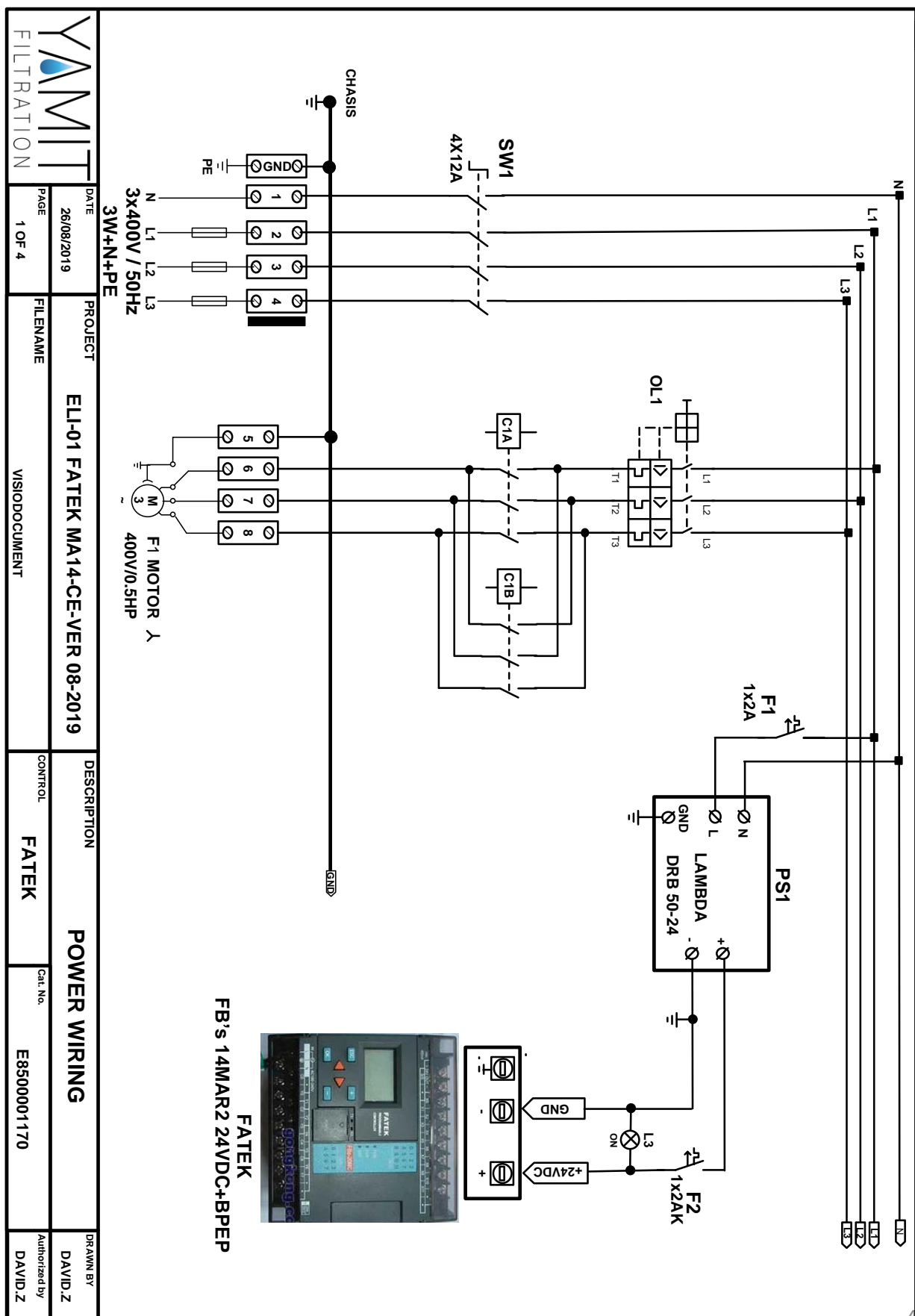


7. ALARM SYSTEM SCREEN

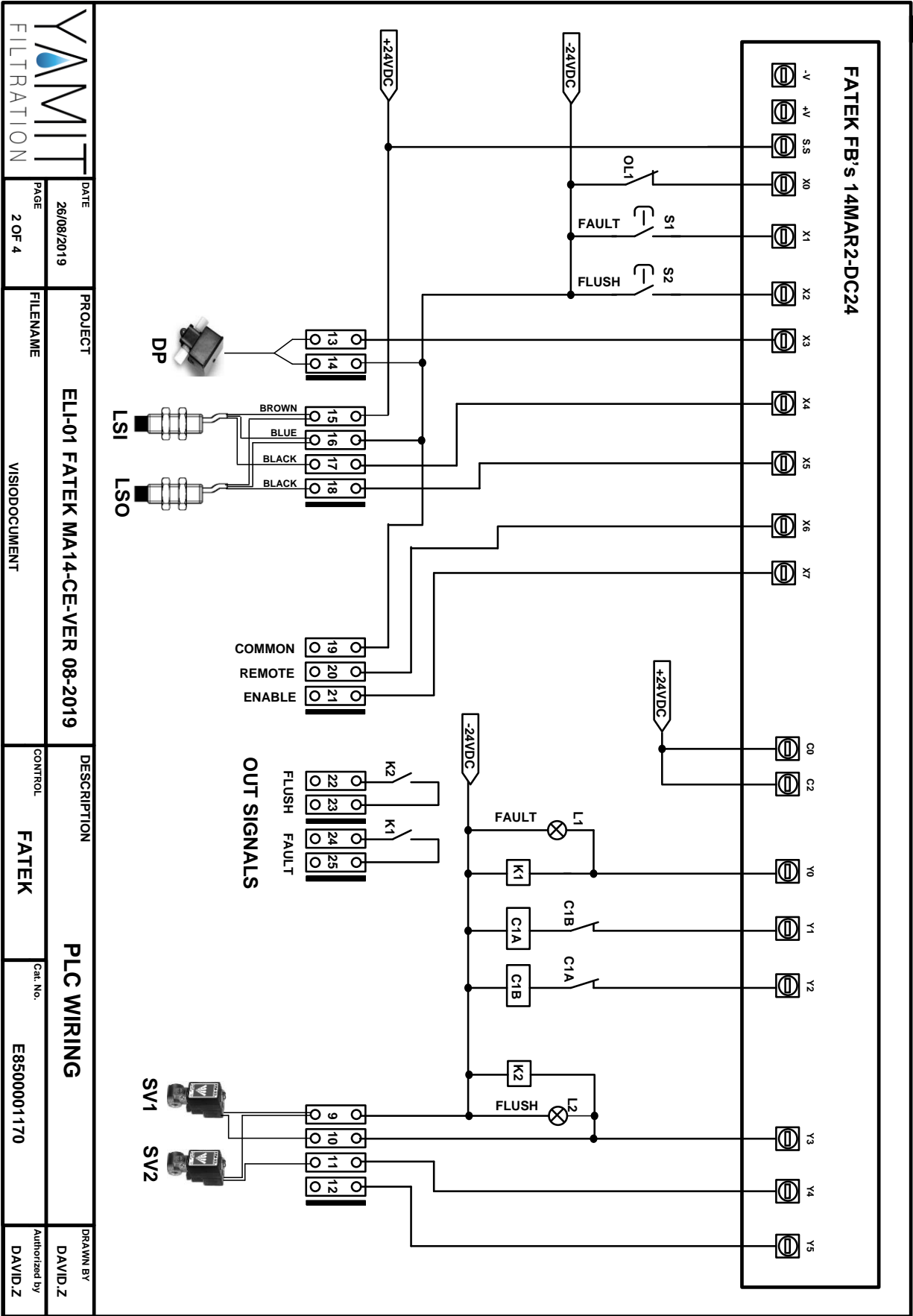
The alarm screen is a pop-up screen that can be reset with the display ESC key.



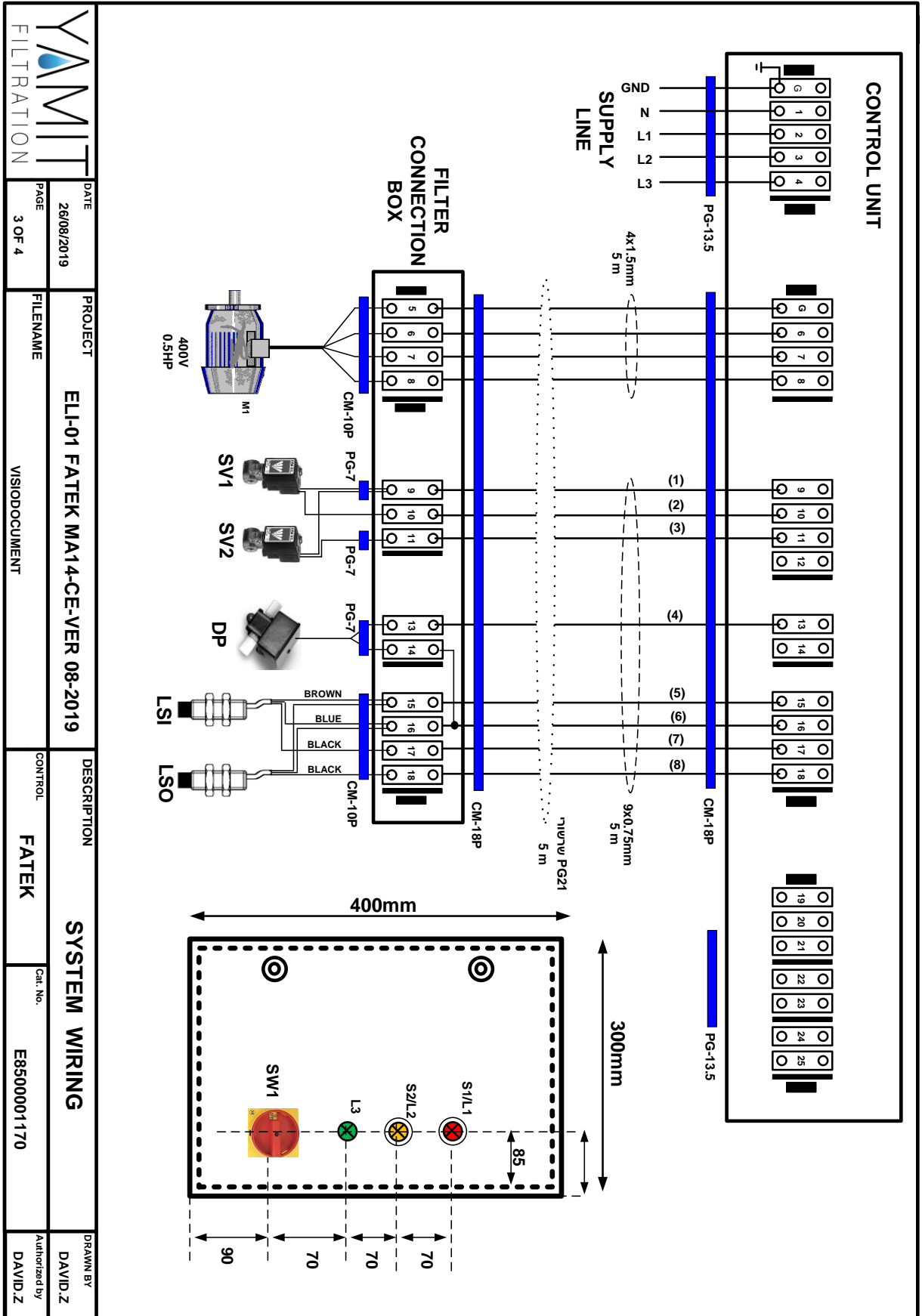
Electrical Drawings



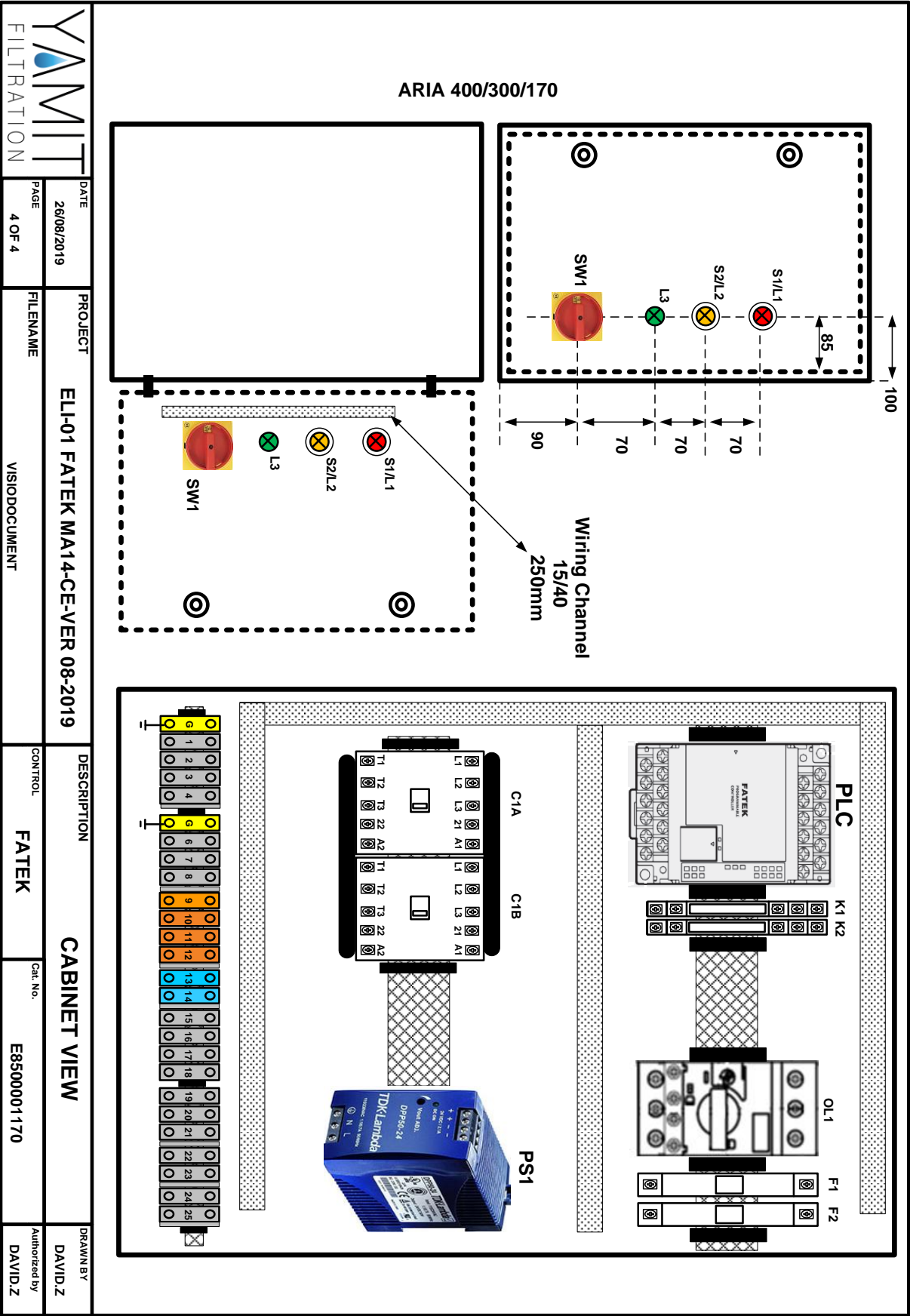
Electrical Drawings



9.2 System Wiring



9.3 – Cabinet View



10. STANDARD INTERNATIONAL WARRANTY

YAMIT Filtration & Water Treatment Ltd. (hereinafter -" **YAMIT**") guarantees to the customers who purchased **YAMIT**'s products directly from **YAMIT** or through its authorized distributors, that such products will be free from defect in material and/or workmanship for the term set forth below, when such products are properly installed, used and maintained in accordance with **YAMIT**'s instructions, written or verbal.

Should such products prove defective within one year as of the day it left **YAMIT**'s premises, and subject to receipt by **YAMIT** or its authorized representative, of written notice thereof from the purchaser within 30 days of discovery of such defect or failure - **YAMIT** will repair or replace or refund the purchase price, at its sole option, any item proven defective in workmanship or material.

YAMIT will not be responsible, nor does this warranty extend to any consequential or incidental damages or expenses of any kind or nature, regardless of the nature thereof, including without limitation, injury to persons or property, loss of use of the products, loss of goodwill, loss of profits or any other contingent liabilities of any kind or character alleged to be the cause of loss or damage to the purchaser.

This warranty does not cover damage or failure caused by misuse, abuse or negligence, nor shall it apply to such products upon which repairs or alterations have been made by other than an authorized **YAMIT** representative.

This warranty does not extend to components, parts or raw materials used by **YAMIT** but manufactured by others, which shall be only to the extent warranted by the manufacturer's warranty.

No agents or representatives shall have the authority to alter the terms of this warranty nor to add any provisions to it not contained herein or to extend this warranty to anyone other than **YAMIT**'s customers.

THERE ARE NO WARRANTIES, EXPRESS OR IMPLIED, EXCEPT THIS WARRANTY WHICH IS GIVEN IN LIEU OF ANY OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING ANY IMPLIED WARRANTY OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

