

# AMIAD Automatic Filters

## “ABF-L” FILTERS

### Automatic Brush Filters 8” - 14”

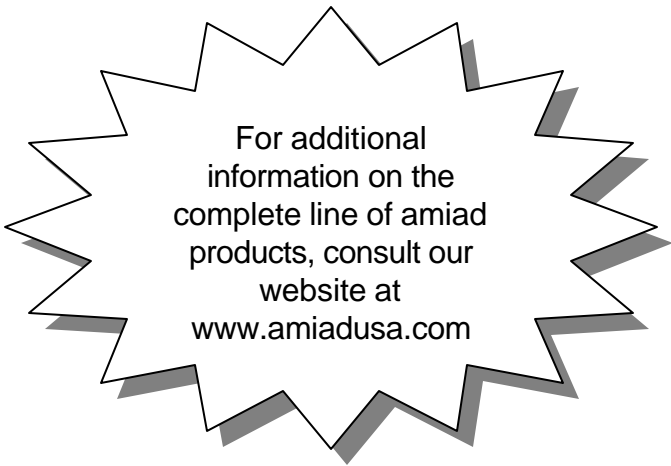
Serial Number: \_\_\_\_\_

Order Number: \_\_\_\_\_

Catalogue Number: \_\_\_\_\_

Filtration Degree: \_\_\_\_\_

Tested By: \_\_\_\_\_



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## Installation, Operation and Maintenance Instructions

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With any inquiry please quote Filter Serial Number, located on the filter nameplate.

# Technical specifications

## General

Maximum flow rate	700 m <sup>3</sup> /h	3100 USgpm	Consult manufacturer for optimum flow according to filtration degree and water quality
Min. working pressure	1 bar	15 psi	
Max. working pressure	10 bar	150 psi	16 bar (240 psi) upon request
Filter area	6000 cm <sup>2</sup>	930 in <sup>2</sup>	
Inlet/Outlet diameter	200, 250, 300 and 350 mm	8", 10", 12" and 14"	
Filter housing diameter	400 mm	16"	
Max. working temp.	70°C	158°F	
Weight	200 mm = 213 kg	8" = 470 lb.	
	250 mm = 228 kg	10" = 503 lb.	
	300 mm = 237 kg	12" = 523 lb.	
	350 mm = 260 kg	14" = 573 lb.	
Filter screen	200 - 3500 micron		Stainless Steel 316L
Type of screen	800 - 3500 micron		Perforated screen
	200 - 800 micron		Wedgewire screen

## Flushing data

Exhaust valve	50 mm	2"	or 80 mm (3") if pressure lower than 2.5 bar
Flushing cycle time	15 seconds	15 seconds	
Flushing water per cycle	200 litre	53 gallon	at 4 bar (60 psi)
Minimum flow for flushing	50 m <sup>3</sup> /h	220 USgpm	

## Control and electricity

Electric motor	¾ HP / 14 Output R.P.M
Rated operation voltage	3 phase, 380V 50 Hz, or 220/440V 60 Hz
Control voltage	24V AC (24V DC upon request)

## Construction materials

Filter housing and lid	Carbon Steel 37-2 (Stainless Steel available on request)
Screen	Stainless Steel 316L
Cleaning mechanism	Stainless Steel 316 , PVC and Delarin
Exhaust valve	Epoxy-Coated, Cast Iron
Seals	Nitrile rubber, Natural rubber, Teflon
Control system	Brass, Stainless Steel, Engineering plastic, Polyethylene

## Filtration degrees available

	Perforated Screen			Wedgewire Screen			
micron	3500	2500	1500	800	500	300	200
mm	3.5	2.5	1.5	0.8	0.5	0.3	0.2
mesh	4	6	10	20	30	50	80

For special applications, also available 130 micron.

## **SAFETY INSTRUCTIONS**

### **General**

1. Prior to installation or any treatment given to the filter, read carefully the installation and operation instructions.
2. While treating the filter, all conventional safety instructions should be observed in order to avoid danger to the workers, the public or to property in the vicinity.
3. Please note: The filter enters into a flushing mode automatically, without prior warning.
4. No change or modification to the equipment are permitted without a written notification given by the manufacturer or by its representative, on the manufacturer behalf.

### **Installation**

1. Install the filter according to the installation instructions detailed in this manual.
2. Make sure to leave enough clearance so as to enable easy access for future treatments and safe maintenance operations.
3. Electric wiring should be performed by an authorized electrician only, using standardized and approved components.
4. Install main power cut-off switch close to the control panel.
5. If the control panel is installed far away and there is no eye contact with the filter, a power disconnect cut-off switch should be installed near each filter unit.
6. Installation of the filter should be performed so as to avoid direct water splashing on the electrical components or on the control panel.
7. Extra safety devices should be installed on hot water applications to avoid skin burn danger.

### **Operation, Control and Maintenance**

1. Disconnect the filter from power supply before maintenance or treatment.
2. Loosening or unscrewing bolts should be done only after the pressure in the filter had been released.
3. Avoid splashing and water leaking so as to minimize slipping, electrifying or damaging the equipment, caused by moisture.
4. Always open and close valves slowly and gradually.
5. Remove grease and fat material residues in order to avoid slipping.
6. After treatment has been completed, re-assemble the protection covers of the drive mechanism.
7. Manual cleaning of filter element using high water pressure or steam, should be performed in accordance with the cleaning system instructions and without endangering the operator or his vicinity.
8. Manual cleaning of filter element using acid or other chemical agents, should be performed in accordance with the relevant material safety instructions and without endangering the operator or his vicinity.

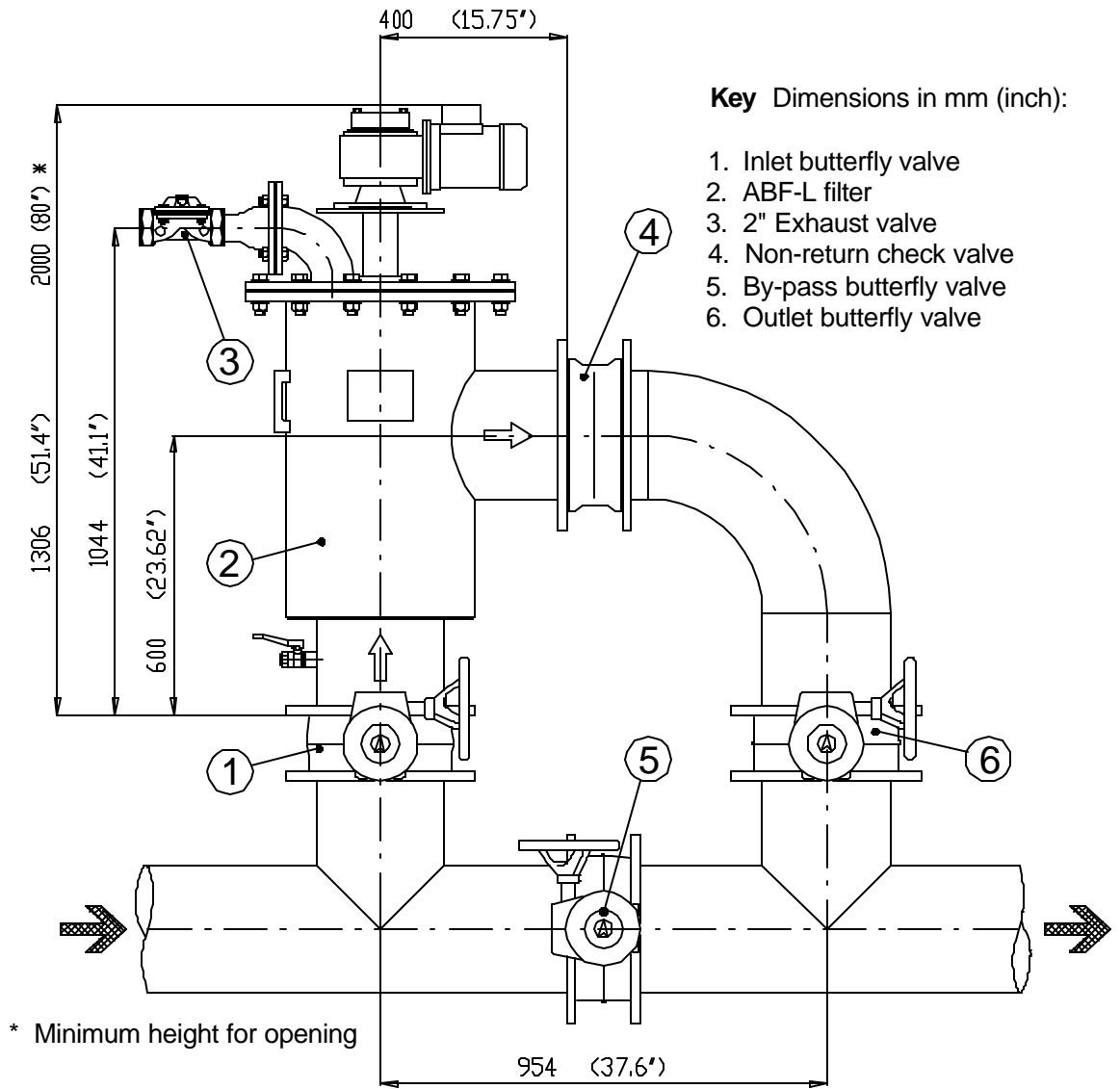
### **Use of Lifting Equipment**

1. While using lifting equipment, make sure that the filter or the lifted part is chained securely and in a safe manner.
2. Do not leave lifted equipment if there is no necessity. Avoid working below lifted equipment.
3. Wear a safety helmet while using lifting equipment.

### **Notes**

1. The user should arrange suitable lighting at the area of the filter to enable good visibility and safe maintenance.
2. The user should arrange suitable platforms and safety barriers to enable easy access to the filter without climbing on pipes and other equipment.
3. Check and re-tighten all bolts after the first week of operation.

# DIMENSIONAL AND RECOMMENDED INSTALLATION DRAWING



## **DESCRIPTION OF FILTER OPERATION**

The automatic "ABF-L" electric filter is a heavy duty, 90° in line filter, which has built in automatic self-cleaning features to maintain and clean the filter screen during operation. The filter is designed to achieve filtration from 3500 micron to 200 micron through varying the filter screen size. The "ABF-L" filter is available in sizes ranging from 8" to 14".

The automatic self-cleaning operation is monitored by the PDS #17 (Pressure Differential Switch) that senses the pressure drop between the inlet and the outlet of the filter. The PDS is factory preset to start the flushing cycle at 0.5 bar (7 PSI) pressure differential.

### **Cleaning Process:**

When the pressure drop between the inlet and the outlet of the filter reaches the preset value, cleaning of the filtration cylinder is operated automatically.

This operation consists of opening an exhaust valve (#12) located on the housing lid and starting the electric motor (#10) which revolves two stainless steel brushes (#6) on the inside of the filtration cylinder (#5).

The particles trapped on the cylinder are dislodged by the revolving brushes and flushed out through the open exhaust valve (#12).

The cleaning operation duration is approximately 15 seconds. The service flow of the filtered water is continuous during the cleaning cycle.

Automatic operation is controlled by the electric board that is supplied with the filter.

### **Stages of Flushing Cycle:**

1. The P.D. Switch sends a signal to the electric board when 0.5 bar (7 PSI) pressure differential has occurred.
2. The exhaust valve opens to the atmosphere.
3. The motor starts rotating the shaft (#6) with the brushes for approximately 15 seconds.
4. The exhaust valve closes.

Through the self cleaning process there is no interruption of flow, and the PDS is constantly monitoring the pressure differential between the inlet and outlet of the filter.

## **INSTALLATION AND START-UP INSTRUCTIONS**

### **Mechanical Considerations**

1. Select a convenient location for the installation of the filter where operation and maintenance will be optimum.
2. It is recommended to prepare a beam or any other arrangement which will allow hanging a crane for opening the filter.
3. Install the filter vertically. Please note that a minimum clearance of 700 mm (28 In.) is required in order to allow disassembly of the unit.
4. Make sure that the direction of the flow is as indicated by the arrow marked on the filter housing. (Flow outlet will always be from the side; flow inlet is from the bottom).

5. If possible, prior to installing the filter, flush the main line, at the connection point thoroughly, in order to remove large objects which may damage the filters internal mechanism.
6. Install a drainage pipe to the exhaust valve (#12). Minimum 2" diameter for a maximum pipe length of 20 meters (60 feet) for longer drainage, a 3" pipe diameter must be used for a maximum length of 40 meters (120 feet). Please note, that no restriction is allowed on the drainage pipe. For special applications, please consult the manufacturer.

### **Electrical Considerations**

1. Connect the appropriate electrical power supply to the control board and the interconnections between the control board and the electrical components on the filter, according to the wiring diagram provided.
2. Install fuses as noted on the electrical schematic and ensure that all electrical connections are well insulated.
3. The electrical wires (conduit) connecting the control board and the filter should be of sufficient length to enable disassembly of the drive unit from the lid without disconnecting these wires.

### **Start-up Considerations**

1. Switch on the main circuit breaker.
2. Press the "TEST" push-button and check the direction in which the motor is rotating. The motor should rotate the brush shaft clockwise. If it is rotating in the other direction - change the direction by swapping the phase connections.
3. Open slowly the valve at the inlet of the filter. If possible with an outlet valve closed and a bypass valve open, and repeat a manual flushing.
4. Open the outlet valve gradually and bring the filter to normal working condition.
5. Check that the PDS is properly functioning by draining its low pressure tube (#17.7). Draining is done by means of the 1/4" valve (# 18). Closing the valve for at least 3 seconds will cause the PDS to send an electric signal to the control board and automatic cleaning will begin.
6. The cleaning operation should be for 15 seconds and full flow out of the exhaust valve should be observed during this entire period. After the 15 second cleaning operation, the flow out of the exhaust valve should stop immediately. Be sure to observe that there is no significant leakage occurring from the exhaust valve once the cleaning operation has completely stopped.

## **ELECTRICAL CONTROL SYSTEM DESCRIPTION**

The ABF-L control board monitors and operates the filter self-cleaning process. The self-cleaning process includes simultaneous operation of the motor and opening of the exhaust valve. The control board will cause the initiation of a flushing cycle as a result of each of the following reasons:

1. Signal from the **PDS**.
2. Manual initiation by **TEST / RESET** push-button.
3. Internal timer, up to 30 hours.

During operation condition the Main Switch, the Motor Protector and the **F2** Circuit Breaker must be "**ON**". In this condition the power pilot light is lit.

### **Flushing by PDS.**

The signal duration from the **PDS** should be longer than the preset time in timer **T0**. It is recommended to set it to 3-5 seconds.

This delay will prevent the filter from entering into flushing mode as a result of a momentary signal from the **PDS**.

### **Flushing by Manual Operation.**

Quick pressing on the **TEST / RESET** push button will cause operation of self-cleaning.

### **Flushing by Timer.**

The timer is located inside the control board and is marked "**T2**". It is possible to set it for intervals from a few minutes up to 30 hours.

To cancel the option of flushing by timer, turn off the **SW-1** switch.

The minimum flushing duration is determined by timer **T1**. It is recommended that flushing duration is set to 15 seconds.

The control board is equipped with a protection circuit. It will cause the filter to enter a "fault" mode if continuous signal from the PDS is received for a duration longer than the preset time in **TAL**. This means that in case that the filter does not manage to clean itself, the **PDS** will continue to send a signal. When the **TAL** time elapses, flushing stops, "fault" pilot light is lit and fault relay is activated. It is possible to use this relay also for an alarm, automatic by-pass, etc.

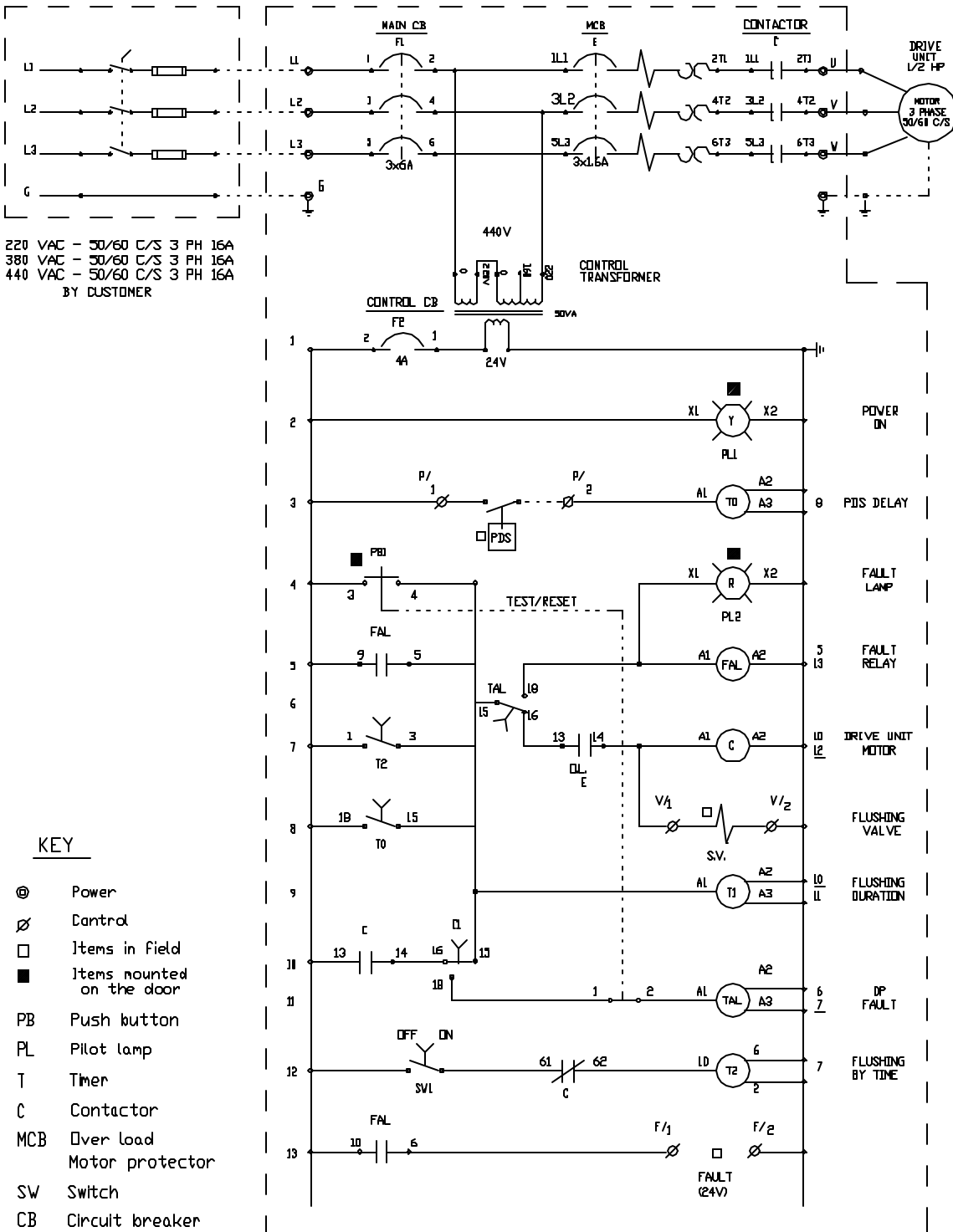
To come out of fault mode, press the **TEST / RESET** push-button.

The recommended preset time for **TAL** is 5 minutes.

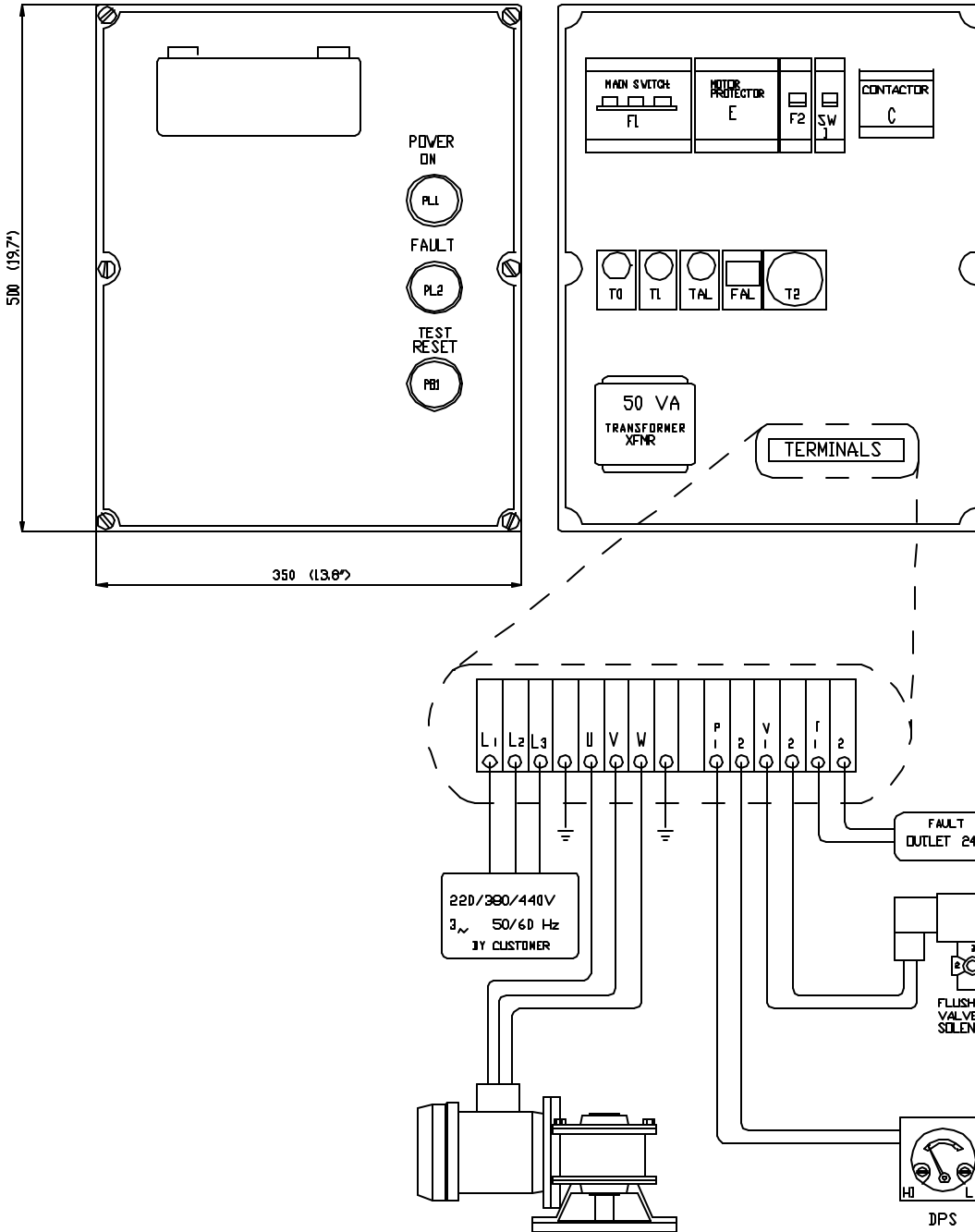
It is possible to order control boards with additional features such as sequential operation of a few filters in a battery, flushing counter, etc.

Follow the drawing in this manual for proper wiring of the control board to the filter.

# ELECTRICAL DIAGRAM



# WIRING SCHEMATIC



## **DISASSEMBLING THE “ABF-L” FILTER**

1. It is recommended to initiate a cleaning cycle prior to the filter disassembling.
2. Close the inlet/outlet valves and drain the filter.
3. Cut off the electrical power.
4. Disconnect electrical cables from the drive unit (#10), unless the cables are long enough and allow the motor to be removed without disconnecting it.
5. Disconnect the flushing pipe from the Exhaust Valve (#12)
6. Pull the electrical plug from the solenoid valve. (#13)
7. Remove Pilot Tube (# 13.6)
8. Unscrew Bolts (# 10.1) and remove the drive unit and the shaft key (# 6.7)
9. Unscrew the housing bolts (# 7.1) and lift up with a crane the filter Lid (# 7) together with the Brush Assembly, Screen and Screen Support.
10. Pull the Split Pin (# 6.6) from the Brush Spindle (# 6.1) while the complete assembly is still hanging in the air, and remove the Screen Support and its Seal (# 3+4).
11. Place the assembly beside the filter on a flat clean area.
12. Loosen nuts (# 9.4) (not necessary to remove them), unscrew the Screen Tightening Bolt (# 7.10) and remove the Lid (# 7) from the Brush Assembly.
13. Pull the Brush Assembly (# 6) out from the screen (# 5). Inspect the brushes and replace if necessary.
14. If necessary, remove the Screen Support Seal (# 3) from the Screen Support (# 4)

**Note:** In case that a crane or other lifting arrangement is not available, it may be easier to remove the lid (step # 12) while the screen and the brush assembly is still inside the filter. The assembly should be lifted just enough to allow access to the Screen Tightening Bolt (# 7.10). The Drive Unit Support (# 8) and the Exhaust Valve (# 11+12) can be removed in order to reduce the assembly weight.

## **RE-ASSEMBLING THE “ABF-L” FILTER**

1. Install the Screen Support Seal (# 3) on the Screen Support (# 4).
2. Verify that the Cylinder Rubber Rings (# 5.1) are located properly on the Screen edges.
3. Place the Screen (# 5) on the Screen Support (# 4).
4. Insert the brush assembly (# 6) in a spiral motion into the Screen Cylinder. Make sure that the lower side of the Spindle Shaft will go through bearing (# 4.1). Insert the Split Pin (# 6.6) into its place.
5. Place the Filter Lid (# 7) on the Screen Cylinder. The Spindle upper Shaft should go through the center hole, the Sealing Ropes (# 9.5) and through the Plastic Bushing (# 9).

6. Tighten the Screen Tightening Bolt (# 7.10) in such way that it will pass through the hole in the screen upper support ring.
7. Seal the shaft by tightening Nuts # 9.4.
8. Verify the existence of the Housing Seal (# 2) in its place. Lift the complete assembly and insert it to the filter housing.
9. Tighten the Lid Bolts (# 7.1) in a balanced and even manner.
10. Place the Shaft Key (# 6.7) in its place, apply some grease on the shaft and install the Drive Unit (# 10)
11. Tighten all bolts and nuts to ensure proper position and sealing.
12. Re-connect the power cables.
13. Switch the power on.
14. Press the TEST push-button and make sure that the filter is working properly.
15. Gradually, turn on the water. If there is a leak from the shaft (# 6.1) tighten the nuts (# 9.4).

## **MAINTENANCE**

### **General inspection.**

In order to check the proper operation of the filter, close the 1/4" valve (# 18) for about 5 seconds. This will initiate the self-cleaning cycle: Check that the exhaust valve opens, the motor is moving and the brushes shaft is rotating.

### **Weekly maintenance.**

1. Check that the filter operates properly, following a general inspection.
2. Clean the 3/4" filter (close the 3/4" valve and operate a flushing cycle in order to release pressure and then open the bowl).
3. If necessary, take care of any leakage from the spindle shaft by tightening the nuts (# 9.4) (Do not tighten them too tight. If needed change the sealing ropes).

### **Maintenance prior to long term cessation of filter operation.**

The following must be done if the filter will not be in operation for more than a month.

1. Operate a flushing cycle (If possible, with a closed downstream valve).
2. Disconnect the control board from the power supply.
3. Release pressure from the filter.
4. Clean the 3/4" control filter.

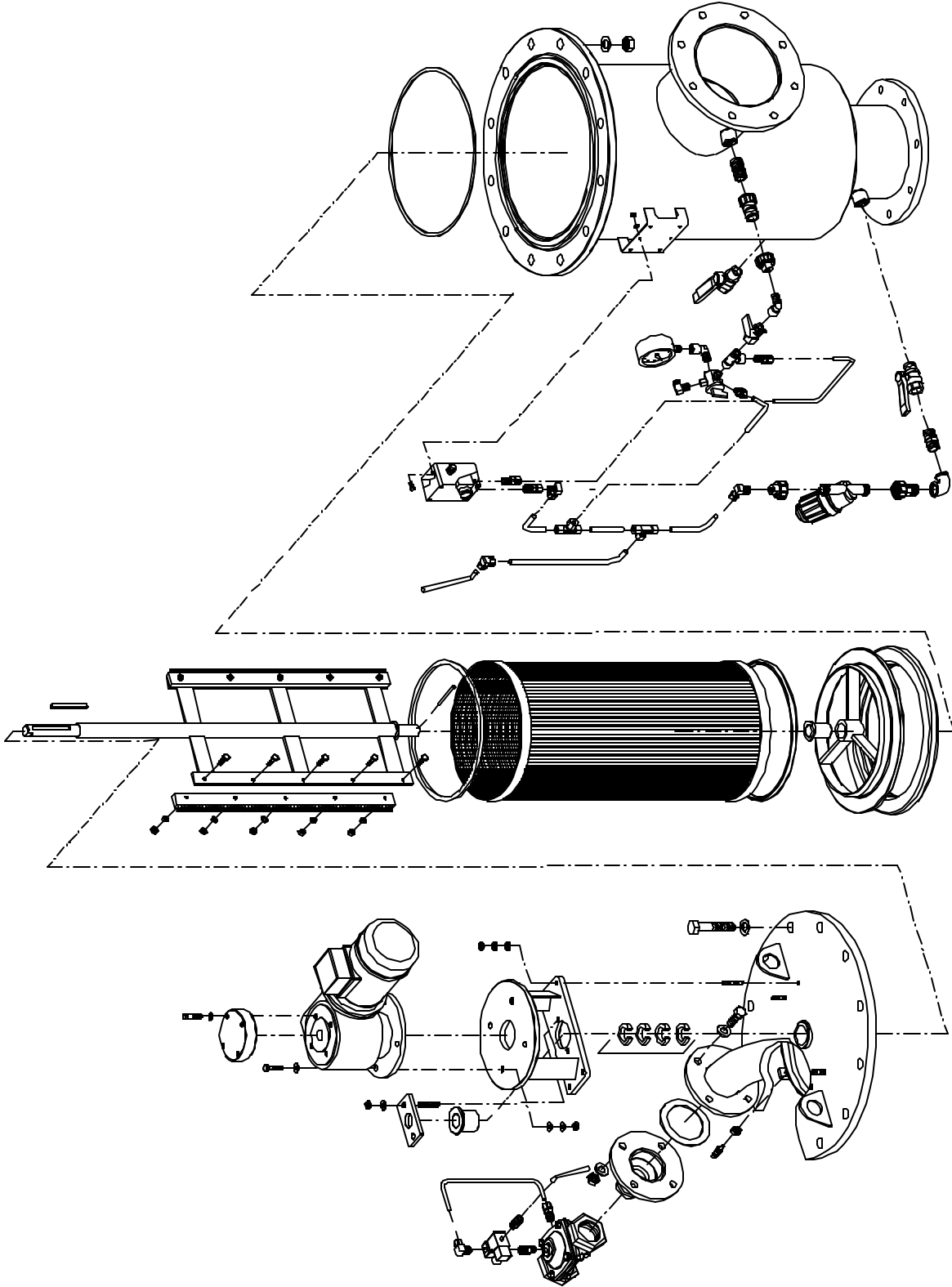
### **Maintenance prior to re-operation.**

1. Change the shaft sealing ropes (# 9.5).
2. Connect the control board to the mains.
3. Check proper operation of the filter.

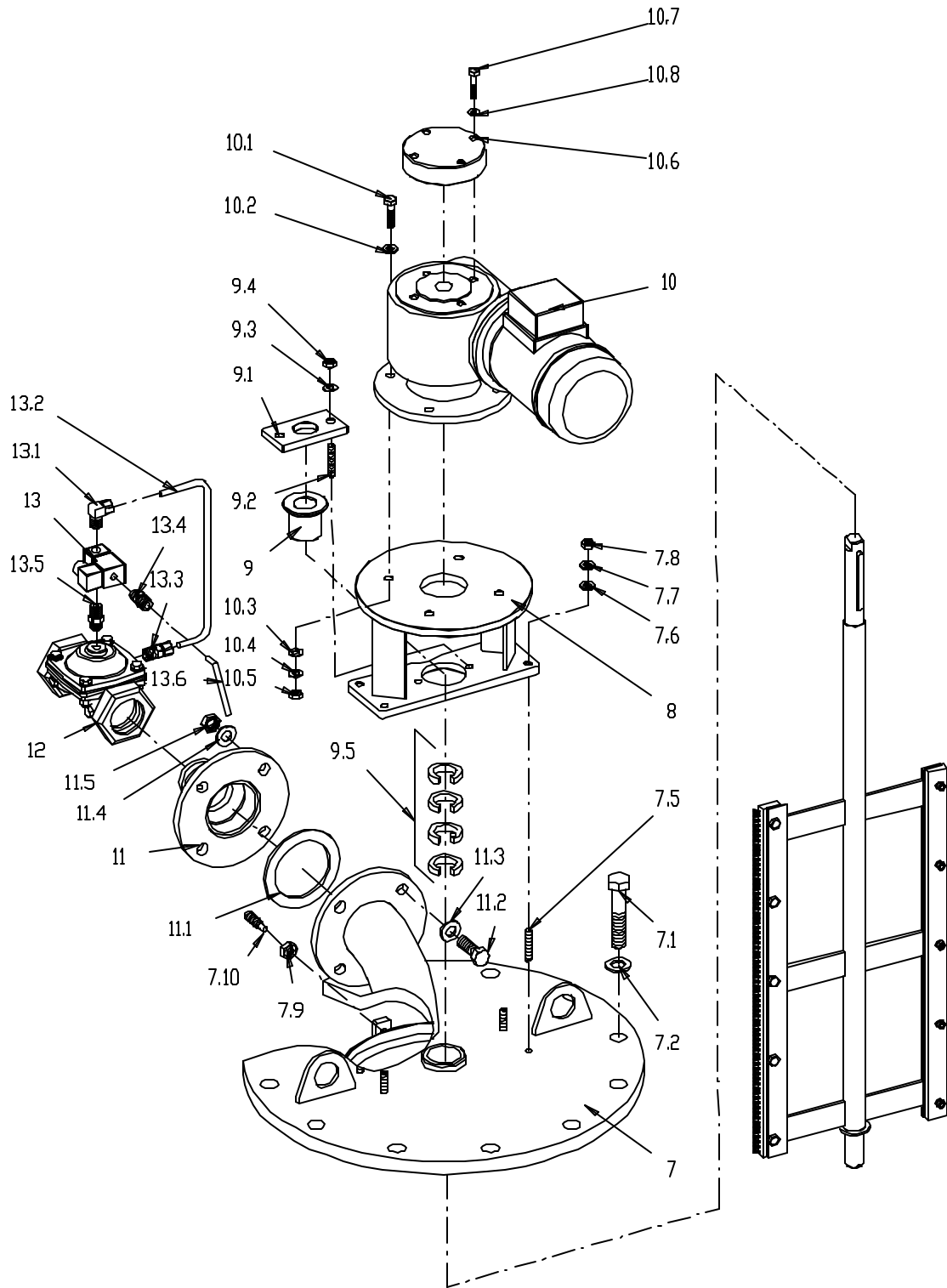
## **PARTS SCHEDULE - ABF-L FILTER**

<b>No.</b>	<b>Description</b>	<b>Cat. No.</b>	<b>No.</b>	<b>Description</b>	<b>Cat. No.</b>
1	8" Filter Housing	13-1087-1100	11.2	M16 X50 Galvanized Bolt(x 4)	85-1112-16-050
	10" Filter Housing	13-1107-1100	11.3	5/8" Galvanized Washer (x 4)	85-1311-10-000
	12" Filter Housing	13-1127-1100	11.4	5/8" Galvanized Washer (x 4)	85-1311-10-000
	14" Filter Housing	13-1147-1100	11.5	M16 Galvanized Nut (x 4)	85-1212-16-000
2	Housing Seal	81-41-4000-0464	12	2" Hydraulic Exhaust Valve	82-31-0323-0000
3	Screen Support Seal	81-41-4300-1001	13	3/2 NO solenoid	82-21-0024-0001
4	Screen Support	13-1067-1010	13.1	L-Connector 5/16" x 1/4"	82-13-0692-0504
4.1	Plastic Bushing	53-1073-1002	13.2	Copper tube 5/16"	82-13-0000-0050
5	Wedgewire Filter Cylinder	53-1083-10XX	13.3	Connector 5/16" x 1/4"	82-13-0682-0504
	Perforated Filter Cylinder	13-1073-00XX	13.4	Connector 5/16" x 1/8"	82-13-0682-0502
5.1	Cylinder Rubber Ring	81-41-4300-0105	13.5	1/4" Connector	52-0100-0020
6	Brush assembly	13-1077-9050	13.6	Copper tube 5/16"	82-13-0000-0050
6.1	Spindle and frame	53-1067-1050	13.7	L-Connector 5/16"	82-13-0652-0005
6.2	St. St. brush (x2)	53-1075-5010	13.8	Copper tube 5/16"	82-13-0000-0050
6.3	M6 X 25 St.St Bolt. (x10)	85-2112-06-025	14	3/4" Ball valve	82-32-0007-1050
6.4	M6 St.St. Washer (x10)	85-2312-06-000	15	L-Connector 3/4"	83-3220-0073-0000
6.5	M6 St.St Nut. (x10)	85-2212-06-000	15.1	3/4" Connector	83-22200075-0050
6.6	3 X 40 Split Pin	84-31-70-0001	16	1"-C Control Filter 0.2 mm	01-1001-1131-8020
6.7	Key 8 mm X 8 mm	63-1067-0101	16.1	3/4 X 1" Raccord Connector	18-4010-0032
7	Filter Lid	13-1077-1100	16.2	1/4 X 1" Raccord Connector	53-0500-9020
7.1	M20 X 80 Galvanized Bolt. (x12)	85-1112-20-080	16.3	L-Connector 5/16" x 1/4"	82-13-0692-0504
7.2	3/4 Galvanized Washer (x12)	85-1311-12-000	16.4	Copper tube 5/16"	82-13-0000-0050
7.3	3/4 Galvanized Washer (x12)	85-1311-12-000	16.5	T Connector 5/16"	82-13-0642-0005
7.4	M20 Galvanized Nut. (x12)	85-1212-20-000	16.6	Copper tube 5/16"	82-13-0000-0050
7.5	M10 X 50 Socket Set Screw (x 4)	85-2132-10-050	16.7	T Connector 5/16"	82-13-0642-0005
7.6	M10 St.St. Washer (x4)	85-2312-10-000	17	PDS Assembly	63-1073-1008
7.7	M10 St.St. Spring Washer (x4)	85-2322-10-000	17.1	Pressure Differential Switch	84-31-10-0001
7.8	M10 St.St. Nut (x4)	85-2212-10-000	17.2	L-Connector 5/16" x 1/8"	82-13-0692-0502
7.9	M10 St.St. Nut	85-2212-10-000	17.3	Copper tube 5/16"	82-13-0000-0050
7.10	Screen Tightening Bolt	63-1067-0121	17.4	M5 X 15 St.St Bolt. (x2)	85-2142-05-015
8	Drive Unit Support	13-1067-1020	17.5	M5 St.St. Washer (x2)	85-2312-05-000
9	Sealing Ropes Tightening Bushing	63-1067-0141	17.6	M5 St.St Nut. (x2)	85-2212-05-000
9.1	Shaft Seal Tightening Plate	53-1067-1040	17.7	Copper tube 5/16"	82-13-0000-0050
9.2	M10 X 50 Socket Set Screw (x 2)	85-2132-10-050	17.8	Connector 5/16" x 1/8"	82-13-0682-0502
9.3	M10 St.St. Washer (x2)	85-2312-10-000	18	1/4" Manometer Valve	82-32-9002-1000
9.4	M10 St.St. Nut (x2)	85-2212-10-000	18.1	1/4 L-Connector M x F	82-12-0125-0404
9.5	Sealing Rope Set	63-1073-1004	18.2	1/4 X 1" Raccord Connector	53-0500-9020
10	ABF-L Drive Unit (Three Phase)	53-1077-3500	18.3	1" M x 3/4 F Plastic Connector	61-4040-4011
10.1	M10 X 40 Galvanized Bolt (x 4)	85-1112-10-040	18.4	3/4 Plastic Connector	83-2820-1075-1075
10.2	3/8" Galvanized Washer (x 4)	85-1311-06-000	19	1/4 Three Way Valve	63-1073-1006
10.3	3/8" Galvanized Washer (x 4)	85-1311-06-000	19.1	L-Connector 5/16" x 1/4"	82-13-0692-0504
10.4	M10 Spring Washer (x 4)	85-1322-10-000	19.2	1/4 T Connector F x F x M	82-13-9000-0025
10.5	M10 Galvanized Nut (x 4)	85-1212-10-000	19.3	Connector 5/16" x 1/4"	82-13-0682-0504
10.6	PVC Shaft Cover	63-1077-0021	19.4	Connector 5/16" x 1/4"	82-13-0682-0504
10.7	M8 X 40 Galvanized Bolt (x 4)	85-1112-08-040	19.5	Copper tube 5/16"	82-13-0000-0050
10.8	M8 Washer (x 4)	85-1312-08-000	20	Pressure Gauge	63-1073-1007
11	3" x 2" Adaptor	13-1075-1110	20.1	1/4 L-Connector M x F	82-12-0125-0404
11.1	3" Flange seal	81-41-4200-0300	21	3/4" Ball valve	82-32-0007-1050

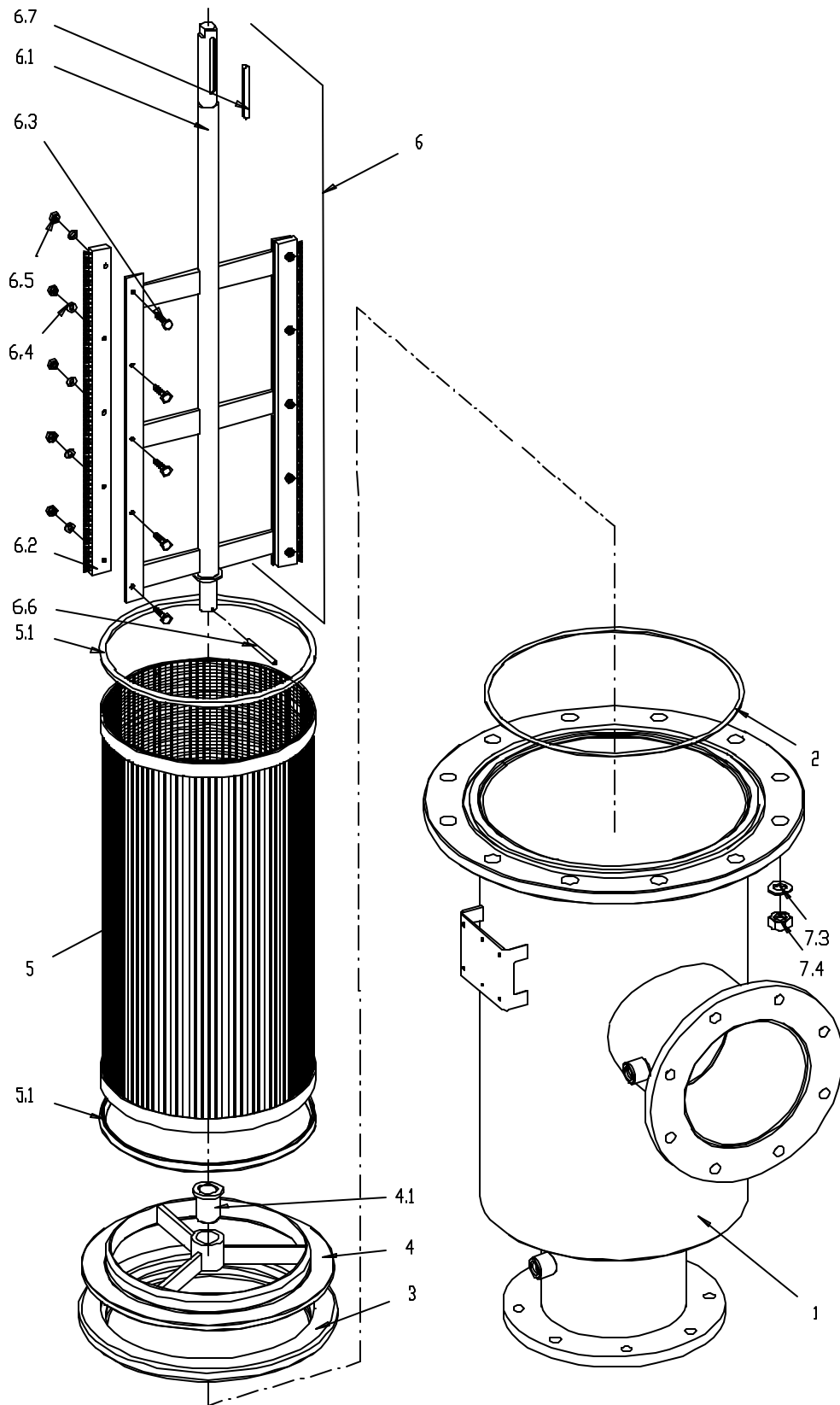
**PARTS DRAWING - ABF-L (General View )**



**PARTS DRAWING - ABF-L (View # 1)**



**PARTS DRAWING - ABF-L (View # 2)**



**PARTS DRAWING - ABF-L (View # 3)**

