

AMIAD Automatic Filters

"EBS-Brush"

Automatic Brush Filters 8" - 14"

Serial Number: _____

Order Number: _____

Catalogue Number: _____

Filtration Degree: _____

Tested By: _____

**Installation, Operation
and Maintenance
Instructions**

03.2001

amiad filtration systems

TABLE OF CONTENTS

Technical Specifications	3
Safety Instructions.....	4
Dimensional and Recommended Installation Drawing....	5
Description of Filter Operation.....	6
Installation and Start-Up Instructions.....	7
Electrical Control System Description.....	8
Electrical Diagram.....	9
Wiring Schematic.....	10
Disassembling the Filter.....	11
Reassembling the Filter.....	11
Maintenance	12
Parts Schedule.....	13
Parts Drawing (General View).....	14
Parts Drawing (View # 1).....	15
Parts Drawing (View # 2).....	16

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

Technical specifications

General

Maximum flow rate	1000 m ³ /h	4400 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	10,000 cm ²	1,550 in ²	
Inlet/Outlet diameter	200, 250, 300 and 350 mm	8", 10", 12" and 14"	
Filter housing diameter	500 mm	20"	
Max. working temp.	70°C	158°F	
Weight	200 mm = 310 kg	8" = 680 lb.	
	250 mm = 325 kg	10" = 715 lb.	
	300 mm = 350 kg	12" = 770 lb.	
	350 mm = 380 kg	14" = 840 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	80 mm	3"	
Flushing cycle time	15 seconds	15 seconds	
Flushing water per cycle	300 liter	80 gallon	at 4 bar (60 psi)
Minimum flow for flushing	70 m ³ /h	310 USgpm	

Control and electricity

Electric motor	1.0 HP / 15 - 18 Output R.P.M
Rated operation voltage	3 phase, 380V 50 Hz, or 220/440V 60 Hz
Upon request	24V DC / 12V DC
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

Filtration degrees available

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

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 modifications 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.

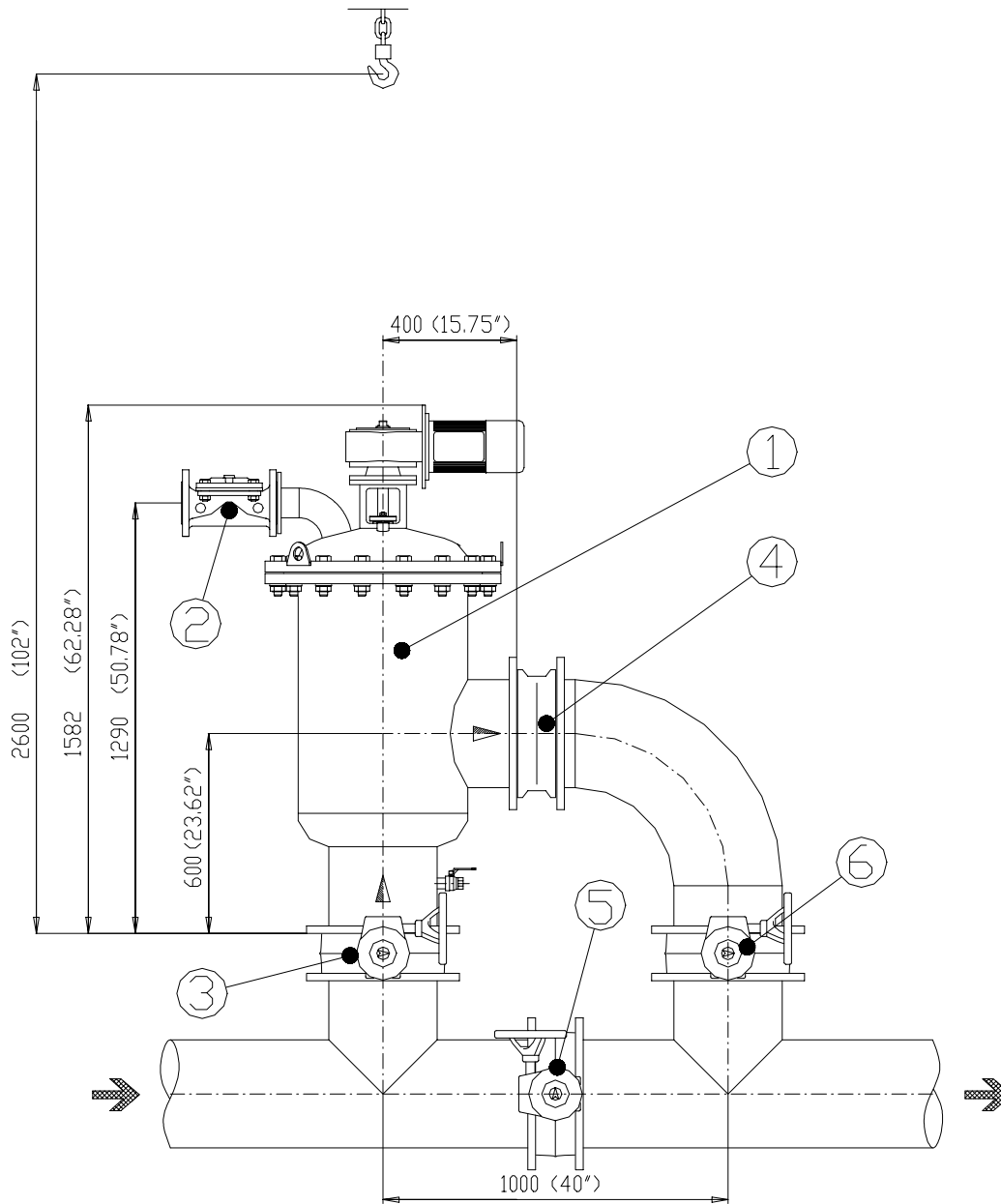
Use of Lifting Equipment

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



Key:

1. EBS-Brush Filter
2. 3" Flushing Valve
3. Inlet Butterfly Valve
4. Non-return Check Valve
5. By-Pass Valve
6. Outlet Butterfly Valve

Dimensions in mm (inch)

DESCRIPTION OF FILTER OPERATION

The automatic "**EBS-BRUSH**" 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 "**EBS-BRUSH**" filter is available in sizes ranging from 8" to 14".

The automatic self-cleaning operation is monitored by the PDS #20 (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 (#19) located on the housing lid and starting the electric motor (#14) which revolves two stainless steel brushes (#7) 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 (#19).

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

The electric board that is supplied with the filter controls automatic operation.

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 (#7) 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 (#19). 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 ensures 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 by-pass 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 (#20.2). Draining is done by means of the 1/4" valve (# 21). 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 **EBS-BRUSH** 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**.

Manual Operation:

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

Flushing according to Time:

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.

Timer T1 determines the minimum flushing duration. It is recommended that flushing duration be set to 15 seconds.

Fault Mode:

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 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.

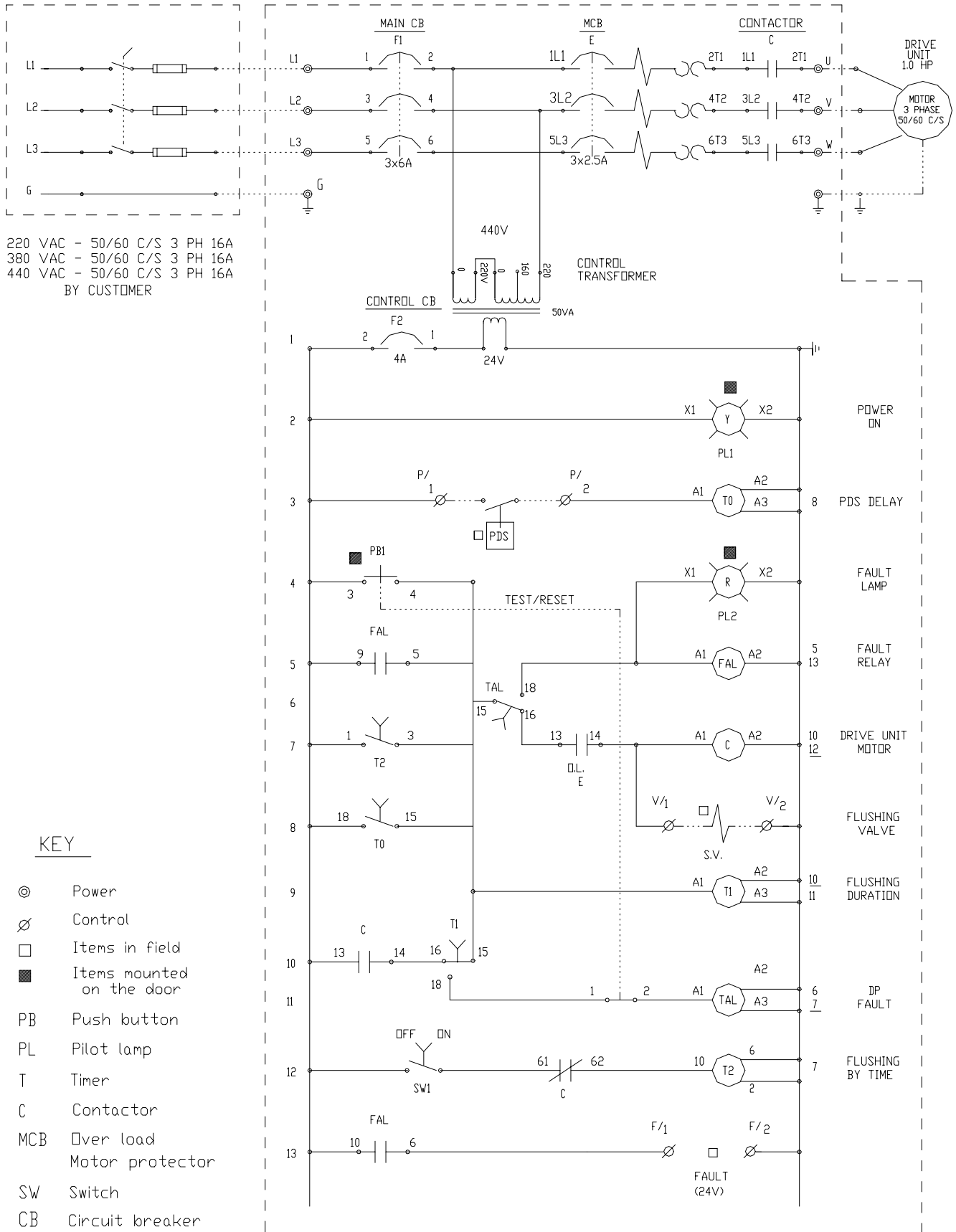
To come out of fault mode, press the **TEST / RESET** push-button.

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

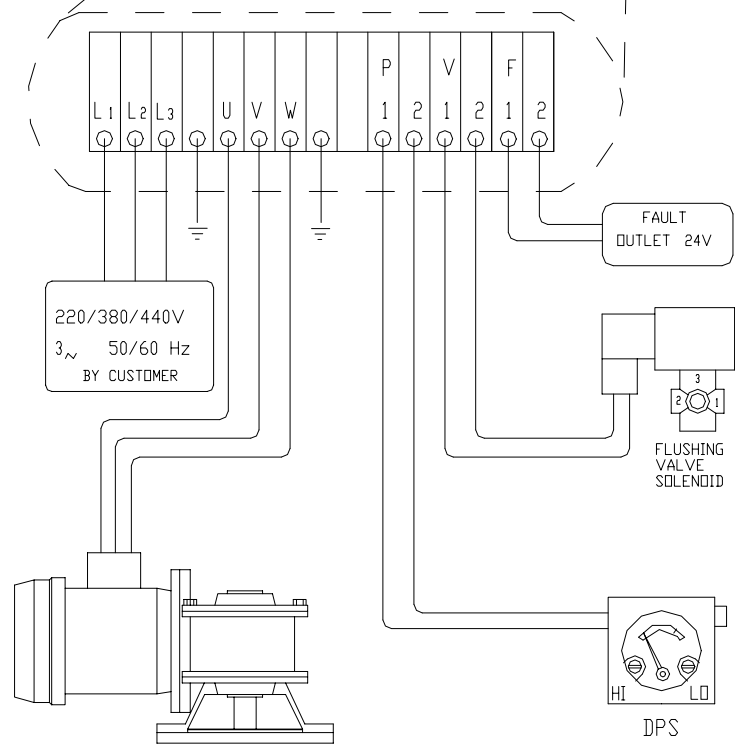
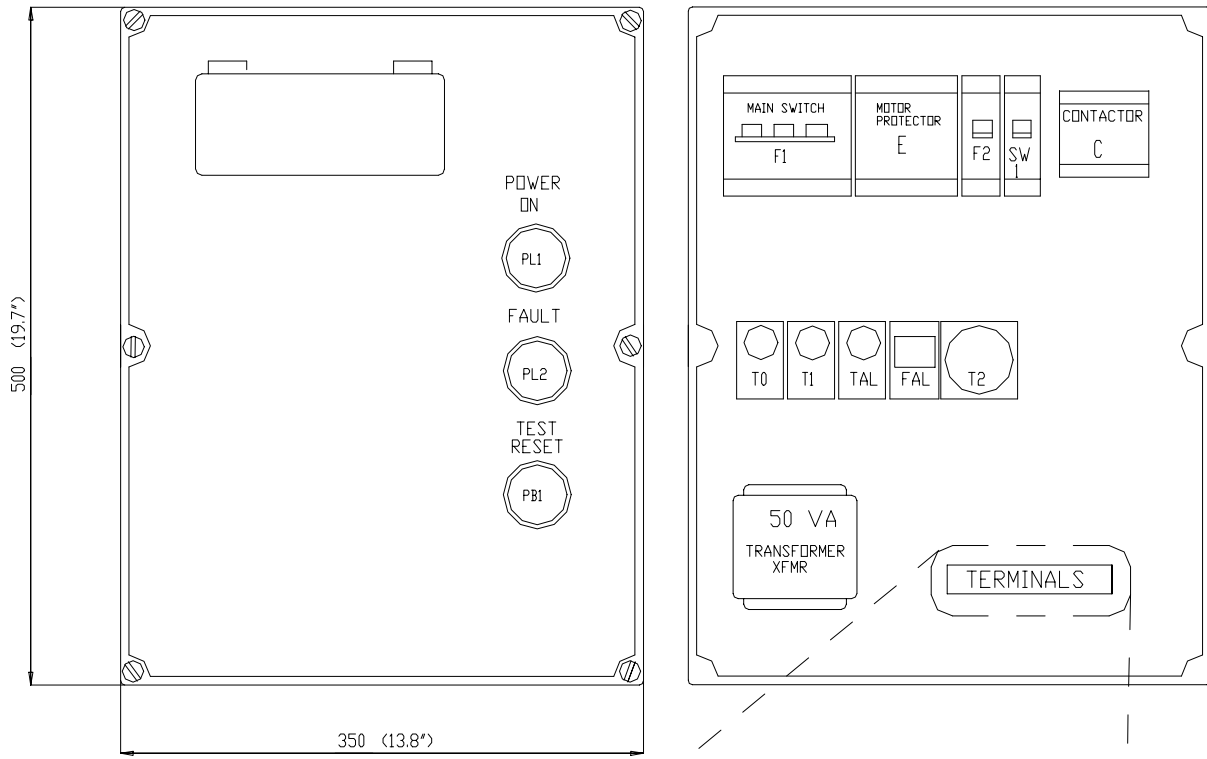
It is possible to order control boards with additional features such as sequential operation of a few filters in a battery, flushing counter, etc.

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

ELECTRICAL DIAGRAM



WIRING SCHEMATIC



DISASSEMBLING THE "EBS-BRUSH" FILTER

1. It is highly 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 (#14), 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 (#19)
6. Pull the electrical plug from the solenoid valve. (#18)
7. Remove Pilot Tube (# 17.3)
8. Unscrew the bolts (19.4) and remove exhaust valve (19).
9. Unscrew Bolts (# 14.1) and remove the drive unit and the shaft key (# 8)
10. Unscrew the housing bolts (# 10) and pull the lid (#9) using a crane or other lifting device, which is assembled, exactly above the lid center.
Note: the lid must be removed in a horizontal position in order to prevent damage to the shaft and the screen seal.
11. Pull the Brush Assembly (# 7) out from the screen (# 5). Inspect the brushes and replace if necessary.

RE-ASSEMBLING THE "EBS-BRUSH" FILTER

1. Before reassembling, visually check that all components are complete and in good mechanical condition.
2. Install the seals (#4 and #6) on the screen (#5) and insert the screen into the filter housing (#1).
3. Insert the Brush Assembly (#7) in a spiral motion into the Screen Cylinder. Make sure the lower side of the spindle shaft will go through bearing (# 3).
4. Locate the housing O-ring (#2) properly in its groove.
5. Lower the filter lid (#9) carefully toward the filter housing (#1) in a horizontal position. The Spindle upper Shaft should go through the center hole of the lid.
6. For centering the lid properly use the two centering sleeves (#11) together with two bolts (10) in opposite positions.
7. Tighten the Lid Bolts (# 10) in a balanced and even manner.
8. Place the Shaft Key (# 8) in its place, apply some grease on the shaft and install the Drive Unit (# 14)
9. Tighten all bolts and nuts to ensure proper position and sealing.
10. Re-connect the power cables.
11. Switch the power on.
12. Press the TEST push-button and make sure that the filter is working properly.
13. Gradually, turn on the water, watch and eliminate any leaking.

MAINTENANCE

General inspection.

In order to check the proper operation of the filter, close the 1/4" valve (# 21) 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 changing the O-ring (#12.2)

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.

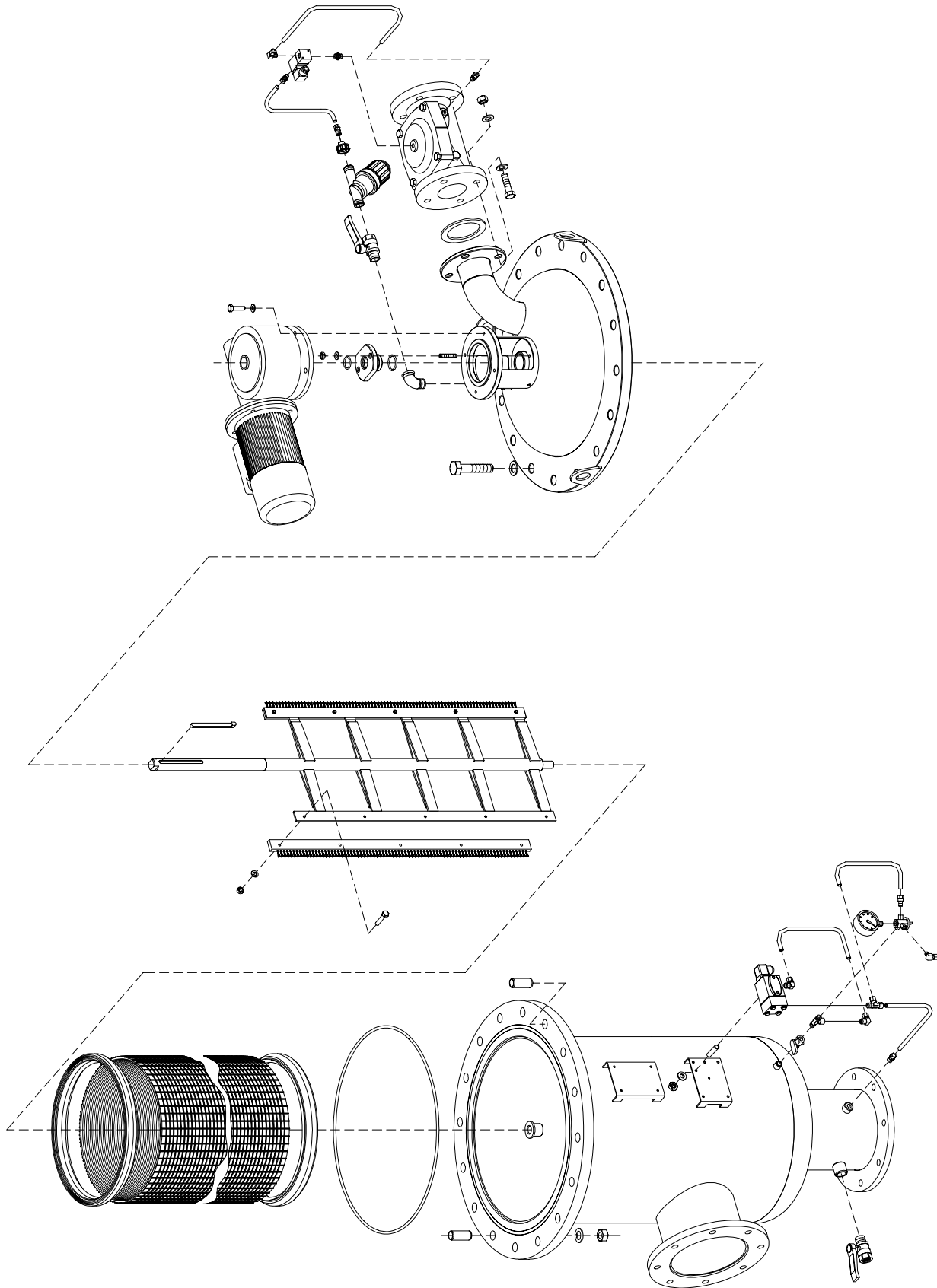
1. Change the shaft sealing O-ring (# 12.2).
2. Connect the control board to the mains.
3. Check proper operation of the filter.

PARTS SCHEDULE - EBS-BRUSH FILTER

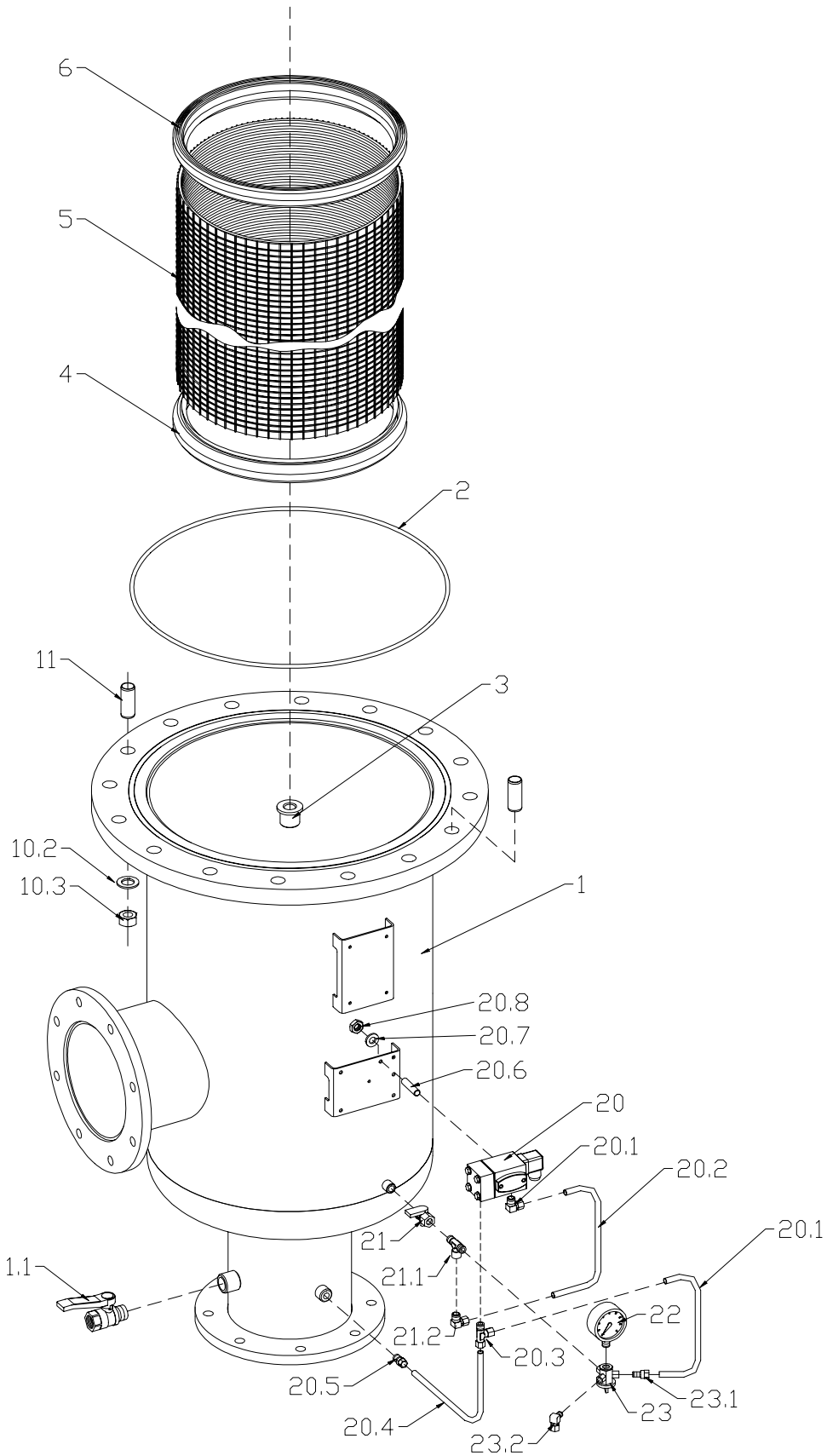
No.	Description	Cat. No.	No.	Description	Cat. No.
1	8" Filter Housing	13-4087-1100*	17	3/4" Control Filter 0.2 mm	01-0702-1131-8020
	10" Filter Housing	13-4107-1100*	17.1	Raccord Connector	53-0500-9010
	12" Filter Housing	13-4127-1100*	17.2	Connector 5/16" x 1/4"	82-13-0682-0504
	14" Filter Housing	13-4147-1100*	17.3	Copper tube 5/16"	82-13-0000-0050
1.1	3/4" Ball valve	82-32-0007-1050	18	Solenoid Valve (GEM-SOL)*	82-21-0024-0001
2	Housing O-Ring P2-471	81-41-4000-0471		Solenoid Valve (ASCO)*	82-21-0024-0010
3	Lower Bearing	63-4071-0012	18.1	Connector 5/16" x 1/8"	82-13-0682-0502
4	EBS Cylinder Seal	81-41-4300-0401	18.2	L-Connector 5/16" x 1/4"	82-13-0692-0504
5	Wedgewire Filter Cylinder	13-4063-00XX	18.3	Copper tube 5/16"	82-13-0000-0050
	Perforated Filter Cylinder	13-4073-0XXX	18.4	Connector 5/16" x 1/4"	82-13-0682-0504
6	EBS Cylinder Seal	81-41-4300-0401	18.5	1/4" Connector	52-0100-0020
7	Brush assembly	53-4065-5100	19	3" Exhaust valve (RAF)	82-31-9310-0000
7.1	Spindle and frame	53-4065-5150		3" Exhaust valve (GAL)	82-31-0030-0000
7.2	St. St. brush (x2)	53-4065-5050		3" Exhaust valve (RAM)	82-31-5030-0000
7.3	M6 St.St Nut. (x10)	85-2212-06-000	19.1	M16 Galvanized Nut (x4)	85-1212-16-000
7.4	M6 St.St. Washer (x10)	85-2312-06-000	19.2	5/8" Galvanized Washer (x4)	85-1311-10-000
7.5	M6 X 25 St.St Bolt. (x10)	85-2112-06-025	19.3	5/8" Galvanized Washer (x4)	85-1311-10-000
8	EBS-Brush Key	63-4065-0005	19.4	M16 X50 Galvanized Bolt (x4)	85-1112-16-050
9	EBS-Brush Lid	13-4065-1110*	19.5	3" Flange seal	81-41-4200-0300
10	M20 X 100 Galvanized Bolt. (x16)	85-1112-20-100	20	P.D. Switch (Midwest)	84-34-10-0003
10.1	3/4" Galvanized Washer (x16)	85-1311-12-000	20.1	L-Connector 5/16" x 1/8"	82-13-0692-0502
10.2	3/4" Galvanized Washer (x16)	85-1311-12-000	20.2	Copper tube 5/16"	82-13-0000-0050
10.3	M20 Galvanized Nut (x16)	85-1212-20-000	20.3	T-Connector 1/4" X 5/16" X 5/16"	82-13-1722-0504
11	Centering Sleeve (x 2)	63-4071-0011	20.4	Copper tube 5/16"	82-13-0000-0050
12	EBS-Brush, Sealing Flange	63-4065-0006	20.5	Connector 5/16" x 1/4"	82-13-0682-0504
12.1	O-Ring 38 X 4	81-41-4100-4038	20.6	M6 X 25 Socket Set Screw (X 2)	85-2162-06-025
12.2	O-Ring 32 X 4	81-41-4100-4032	20.7	M6 St.St. Washer (X2)	85-2312-06-000
13	M10 X 50 Socket Set Screw (x 2)	85-2132-10-050	20.8	M6 St.St Nut. (X2)	85-2212-06-000
13.1	M10 St.St. Washer (x2)	85-2312-10-000	21	1/4" Manometer Valve	82-32-9002-1000
13.2	M10 St.St. Nut (x2)	85-2212-10-000	21.1	1/4" T Connector F x F x M	82-13-9000-0025
14	EBS-Brush Drive Unit	53-4065-3501*	22	Pressure Gauge	63-1073-1007
14.1	M10 X 40 Galvanized Bolt (x 4)	85-1112-10-040	23	1/4" Three Way Valve	63-1073-1006
14.2	3/8" Galvanized Washer (x 4)	85-1311-06-000	23.1	Connector 5/16" x 1/4"	82-13-0682-0504
15	3/4" Angle	83-3225-0073-0000	23.2	L-Connector 5/16" x 1/4"	82-13-0692-0504
16	3/4" Ball valve	82-32-0007-1000	23.3	Copper tube 5/16"	82-13-0000-0050

Catalogue Number might differ to filter diameter, flange standard or electricity specifications.

PARTS DRAWING - EBS-BRUSH (General View)



PARTS DRAWING - EBS-BRUSH (View # 1)



PARTS DRAWING - EBS-BRUSH (View # 2)

