

***AUTOMATIC FILTERS, INC.***

2672 S. LA CIENEGA BLVD.  
LOS ANGELES, CA 90034  
310 839 2828 800 336 1942  
FAX 310 839 6878  
[www.Tekleen.com](http://www.Tekleen.com)  
[info@Tekleen.com](mailto:info@Tekleen.com)

**LPF** USERS'  
MANUAL

**Tekleen**

## Table of Contents

SECTION I	INTRODUCTION	
1.1	Description	1
1.2	Theory of Operation	1
1.3	Recommended Applications	1
1.4	Design Features	2
1.5	Filter Specifications Chart	3
1.6	Measurement Conversion Table	3
SECTION II	INSTALLATION AND HOOK-UP	
2.1	Mechanical Hook-Up and Orientation	4
2.2	Plumbing Hook-Up	4
2.3	GB6, DP Gauge, and Electric Ball Valve Connection	5
SECTION III	OPERATION AND ADJUSTMENTS	
3.1	Start-up	6
3.2	Backflush Requirements	7
SECTION IV	MAINTENANCE	
4.1	Filter Cleaning	8
4.2	Dirt Collector Replacement	8
4.3	Piston Removal/Replacement	8
4.4	Periodic Inspection	9
SECTION V	TROUBLESHOOTING GUIDE	
5.1	Excessive Pressure Drop Through Filter Without Flushing	9
5.2	Frequent Continuous Flushing While Filling Main Pipeline	10
5.3	Frequent Continuous Flushing During Normal Operation	10
5.4	Screen Will Not Clean Properly	11
SECTION VI	SPARE PARTS	
6.1	Recommended Spare Parts	12
6.2	Spare Parts List	12
APPENDICES		
Appendix I	Special Construction and Features	13
Appendix II	System with Discharge to Atmosphere	14
Appendix III	Piston	14
ILLUSTRATIONS		
	Particle Removal Process	15
	Pressure Drop Chart	16
	LPF Cutaway	17
	LPF with GB6 Controller	18
	2XLPF with GB7 Controller	19
	LPF with Pressure Sustaining Valve	20
	LPF with Bypass Relief Valve	21
WARRANTY		22

## **SECTION I      INTRODUCTION**

### **1.1    Description**

The LPF series models (Low Pressure Filter) are automatic, self cleaning screen type water filters. The filtration system consists of a tank body with a coarse screen, fine screen, electric motor, single flush valve and an electronic controller.

### **1.2    Theory of Operation**

Pressurized water enters the filter inlet and travels through the coarse screen from the outside in. The water then travels through the fine screen from the inside out where small contaminants (down to 25 microns) are filtered. The clean water then exits through the outlet.

When the fine screen becomes contaminated, a pressure differential is sensed causing the automatic controller to open the flushing valve and start the electric motor. When the flushing valve opens, the pressure in the hydraulic motor chamber is reduced causing the clean water to reverse flow at the nozzles through the filter element pushing contaminants off the screen, through the dirt collector and out the flushing valve.

The electric motor rotates the dirt collector as water passes through the nozzles. Lateral movement allows the dirt collector to vacuum the entire screen.

When the screen is clean, the unit automatically closes the electric valve, returning the filter to normal operation.

The entire cleaning cycle takes approximately 10-15 seconds. It should be noted that even during the backflush cycle the filtration process continues uninterrupted.

### **1.3    Recommended Applications**

Tekleen filters are ideal for filtering out silt, scale, sand, rust, dirt and organic material like algae, zebra mussels, and clams from virtually all types of water sources.

## 1.4 Design Features

Among the many features of the LPF models is the avoidance of the danger of forcing contaminated water back into the system, which often happens with sand filters. Tekleen filters will deliver clean water or no water at all.

The most predominant feature is its ability to remove organics such as algae and other suspended particles.

All filter internal elements can be removed and disassembled from the filter body without disruption of the plumbing.

The backwash cycle, Tekrinse, uses 90% less rinse water than other filters on the market today.

For special constructions and applications, see Appendix I, page 13.

## 1.4 Filter Specifications Chart

<b>Model</b>	<b>Flange Size</b> inches	<b>Screen Area</b> sq. ft.	<b>Max Flow</b> gpm
<b>LPF3SP</b>	3	1.4	200
<b>LPF4LP</b>	3	2.5	300
<b>LPF4P</b>	4	1.4'	300
<b>LPF4LPE</b>	4	2.5	400
<b>LPF4LP</b>	4	5	500
<b>LPF6P</b>	6	2.5	600
<b>LPF6XLP</b>	6	8	800
<b>LPF6LP</b>	6	5	800
<b>LPF6SP</b>	6	7	1,750
<b>LPF8P</b>	8	5	1,320
<b>LPF8LP</b>	8	8	1,500
<b>LPF8SP</b>	8	7	1,750
<b>LPF10P</b>	10	7	1,750
<b>LPF10LP</b>	10	11	2,630
<b>LPF12P</b>	12	11	2,630
<b>LPF12LP</b>	12	12.5	4,000
<b>LPF14P</b>	14	12.5	4,000
<b>LPF14LP</b>	14	16	6,000
<b>LPF16LP</b>	16	16	6,000
<b>LPF16SP</b>	16	24	7,000
<b>LPF18SP</b>	18	24	8,000
<b>LPF20SP</b>	20	24	10,000

Specifications: Carbon steel body with baked on powder epoxy coating or stainless steel 316L body at the same price. Internal parts: stainless steel dirt collector, stainless steel screen. Maximum 150 psi, 200° F. Standard screen mesh 50µ to 1000µ. Optional high temperature, and high pressure.

## 1.5 Measurement Conversion Table

<b>Mesh</b>	20	40	60	80	100	140	200	325	550
<b>Micron</b>	850	590	250	177	150	105	74	44	25
<b>Inch</b>	.033	.016	.010	.007	.006	.004	.003	.002	.001

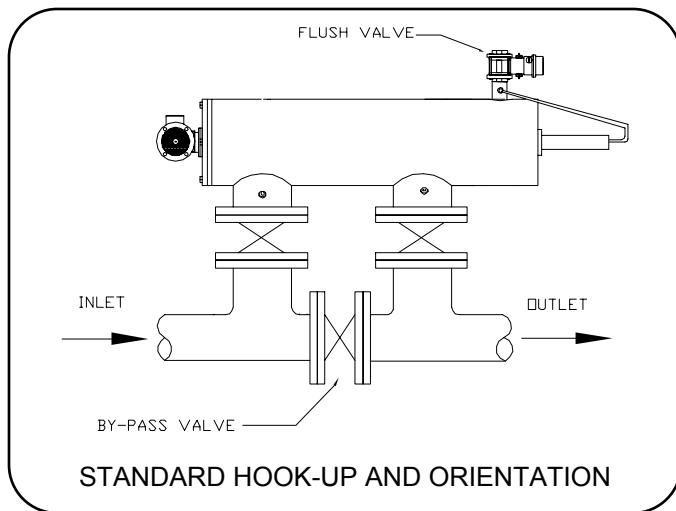
## SECTION II INSTALLATION AND HOOK-UP

### 2.1 Mechanical Hook-Up and Orientation

The positioning of the filter tank should be determined by the disposal of waste water and to allow easy access and removal of filter element (Consult manufacturer for required clearances).

The Tekleen filter can rest on the inlet and outlet flanges or can be mounted on a stand if desired.

The electronic controller should be mounted in close proximity to the filter tank.



### 2.2 Plumbing Hook-Up

The waste discharge pipe should be at least one inch larger in diameter than the size of the discharge valve (1" valve to 2" pipe & 2" valve to 3" pipe). The waste pipe should be kept as short as possible with no more than one elbow.

Discharge lines should not be elevated. This will affect the pressure difference required for the cleaning cycle. If it is necessary to run discharge lines uphill, please consult with the manufacturer.

Note: A block valve should be installed immediately upstream of the filter. During start-up, the block valve should only be barely cracked open to prevent a surge of pressure across the filter when the pump is started. Once the pump is on-line, slowly open the block valve. This would prevent any possible damage to the filter due to a pressure surge.

## 2.3 GB6, DP Gauge, and Electric Ball Valve Connection

Before power is applied to the electronic controller, make all connections between controller, DP Gauge, and electric ball valve (**see page 18**).

1. **BALL VALVE:** Plug controller into appropriate power source. Activate manual start switch and visually inspect the open and close movement of the ball valve.
2. **FLUSHING TIME ADJUSTMENT:** The flush time is normally set to 10 seconds. Flush time should be adjusted to allow piston indicator pin to reach the end of the slot during one backwash cycle. **NOTE:** Excessive flush time will not improve cleaning, and may lead to filter damage.
3. **PRESSURE DIFFERENTIAL ADJUSTMENT:** The differential switch is pre-set for 7 psi. It can be changed to different set points (see your electronic controller manual).

### USING 1/4 INCH DIAMETER TUBING

1. Attach tubing to the low pressure 1/4" fitting (on the outlet flange). Attach the other end of the tubing to the fitting on the DP switch marked "low" pressure.
2. Attach tubing to the high pressure 1/4" fitting (on the inlet flange). Attach the other end of the tubing to the fitting on the DP switch marked "high" pressure.
3. If the filter comes with a piston, attach tubing to the end of piston. Attach the other end to the fitting on the flush outlet (before the flush valve).

**Important Notes:** Do not run tubing more than three feet in length (preferably two feet or less). Due to the pressure drop across the tubing, the electronic controller may not operate properly if tubing is too long.

Electronic controller should be sealed completely to avoid moisture from entering. This will prevent possible shorting of circuits.

For more operating details and set-up, please refer to your electronic rinse controller manual.

## **SECTION III      OPERATION AND ADJUSTMENTS**

### **3.1    Start-Up**

During start-up, the block valve at the filter inlet should be cracked open to prevent a surge of pressure across the filter when the pump is started. Once the pump is on-line, slowly open the block valve. This will prevent any possible damage to the filter due to a pressure surge.

During the initial filling of the main pipeline, there may not be enough back-pressure downstream from the filter to allow the cleaning cycle to function properly. Therefore, it is necessary to install a valve on the outlet line to be partially closed (i.e., gate valve, ball valve or butterfly valve).

If a downstream main line valve is partially closed, enough to provide 15 psi on the filter inlet pressure gauge, the self cleaning cycle will operate properly.

Once the total system is fully charged, the downstream valve can be adjusted, as long as 15 psi is maintained at the inlet flange during the backwash cycle.

If systems are to come on automatically, it is advisable to install a flow control or a pressure sustaining valve downstream from filters to create backpressure on filters in order to enable proper flushing while pipe lines are being filled.

Once the system is fully charged push the manual flush button on the electronic controller, check the rotation of the electric motor on the end cover. The motor should turn clockwise during the flush cycle.

### 3.2 Back-Flush Requirements

The filter needs a minimum flow and pressure during the backflush process to guarantee a fully effective cleaning.

The minimum flow depends on the size of the filter's flush outlet and the pressure during backflushing. The table below gives an indication of the required flows.

Flush Outlet Size	Flush Flow at 35 psi (gpm)
1"	40
2"	160

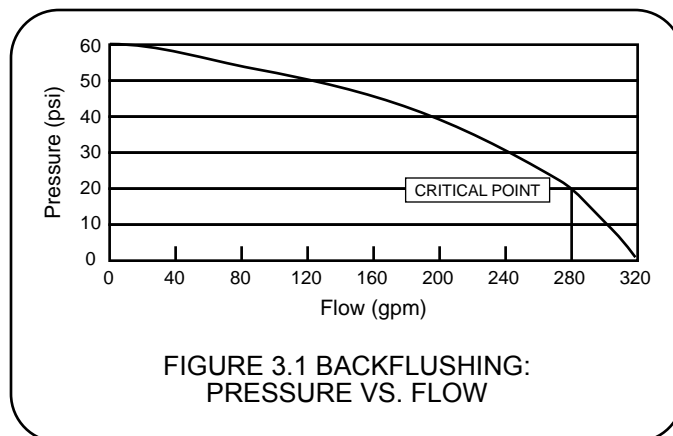
The minimum differential pressure between the filter inlet and the flush outlet should be at least 15 psi during backwash.

The capacity of the pump has to be sufficient to keep the pressure over 15 psi during backflushing at a flow of process flow + rinse capacity.

For example (see Fig. 3.1):

Process flow is 210 gpm and rinse capacity is 90 gpm  
Pressure < 15 psi yields poor cleaning.

Process flow is 130 gpm and rinse capacity is 90 gpm  
Pressure > 15 psi yields good cleaning.



## SECTION IV

## MAINTENANCE

### 4.1 Filter Cleaning

Periodic cleaning and inspection of the coarse screen, if supplied, is necessary for removal of large particles trapped in the chamber. It is also recommended that the fine screen be inspected during coarse screen cleaning. In hard water applications, it is beneficial to wash the fine screen in a mild acid.

Proceed as follows:

1. Turn outlet valve off completely.
2. Open the bypass valve.
3. Close inlet valve.
4. Relieve any residual pressure by detaching the 1/4" plastic tubing from any fitting.
5. Unscrew nuts and remove lid.
6. Remove coarse screen if supplied.
7. Remove fine screen using screen puller/pusher.
8. Grease all o-rings with waterproof o-ring lubricant.
9. Re-assemble unit.

### 4.2 Dirt Collector Replacement

If the dirt collector should ever need replacing, follow steps 1 through 7 in section 4.1 (Filter cleaning). Then remove the dirt collector for inspection.

### 4.3 Piston Removal/Replacement

If the piston needs to be removed or replaced, follow steps outlined as follows and refer to Fig. 4.3:

1. Follow steps 1-4, section 4.1
2. Unscrew all connection nuts.
3. Remove piston from the filter housing.
4. Re-assemble unit (reverse procedure).

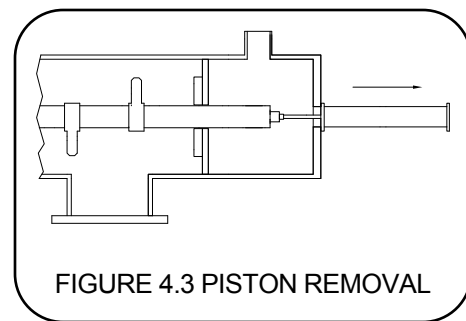


FIGURE 4.3 PISTON REMOVAL

#### 4.4 Periodic Inspection

The following parts should be inspected annually for wear and tear and should be replaced if necessary:

- Cover Seal
- Fine Screen
- Piston
- Dirt Collector
- Lower Bearing
- Coarse Screen
- O-rings
- Electric Motor Packing
- Upper Bearing
- Air/Water Connections

### **SECTION V      TROUBLESHOOTING GUIDE**

#### 5.1 Problem: Excessive pressure drop through filter without flushing.

##### POSSIBLE CAUSE

Controller is not turned on.

##### SOLUTION

Turn on Power.

##### POSSIBLE CAUSE

Filter is installed backwards.

##### SOLUTION

Install filter according to manual drawings.

##### POSSIBLE CAUSE

Electric valve is wired to the controller incorrectly.

##### SOLUTION

Verify proper wiring, pages 18-21.

5.2 Problem: Frequent/continuous flushing while filling main pipeline.

POSSIBLE CAUSE

Downstream pressure is not available to provide vacuum cleaning power.  
Rapid-filling flow rate exceeds the controllers' pressure differential.

SOLUTION

Partially close downstream mainline valve; filter inlet gauge should read 15 psi.

POSSIBLE CAUSE

Filter may have been shut down "dirty" with a layer of contaminant that is difficult to remove after it dries on the screen.

SOLUTION

A Superflush needs to be performed as follows: a downstream mainline valve should be partially closed to increase inlet working pressure. After the valve is partially closed, run the filter through several flush cycles. This process uses the entire available differential pressure in the filter cleaning process. If this fails, the screen may be removed and cleaned manually.

5.3 Problem: Frequent/continuous flushing during normal operation.

POSSIBLE CAUSE

Very dirty water.

SOLUTION (for electronic controller only)

Increase flushing time so the indicator pin on the piston reaches the end of the pin groove.

POSSIBLE CAUSE

The set point on the differential pressure switch is set too close to zero, causing vibration to initiate a flush cycle.

SOLUTION

Increase pressure differential set point.

**POSSIBLE CAUSE**

Screen may be partially plugged.

**SOLUTION**

Perform Superflush as described above in section 5.2.

**POSSIBLE CAUSE**

Dirt collector may be jammed which results in only cleaning the screen area that is directly in front of the nozzles.

**SOLUTION**

Open tank and check for free movement of dirt collector mechanism.

**POSSIBLE CAUSE**

Piston is jammed

**SOLUTION**

Remove piston from the filter housing and make sure it is moving freely. O-rings and U-cups may need lubrication. Check mini-filter for unrestricted flow.

**POSSIBLE CAUSE**

Coarse screen is contaminated.

**SOLUTION**

While running, check pressure between filter inlet and hydraulic pressure chamber (if available). The difference between these two Readings is the pressure drop through the coarse screen. It should be zero.

#### 5.4 Problem: Screen will not clean properly.

##### POSSIBLE CAUSE

Restriction in flushing valve dump line due to long “run” distance (e.g., running uphill, 2” line more than 20’ long, 2” line has more than one elbow).

##### SOLUTION

Increase pipe size, remove any elbows, avoid elevation gain of pipe after flush valve.

##### POSSIBLE CAUSE

Filter was shut down “dirty” with a layer of contaminant dried on the screen.

##### SOLUTION

Perform Superflush as described on Section 5.2, page 10. If unsuccessful, remove filter screen (see section 4.1, page 8) and spray the screen with a high pressure hose to remove the contaminant.

## **SECTION VI                      SPARE PARTS**

### 6.1 Recommended Spare Parts

The following are recommended spare parts to keep in stock:

- |                 |                    |
|-----------------|--------------------|
| - Fine Screen   | - Set of O-rings   |
| - Cover Gasket  | - Dirt Collector   |
| - Upper Bearing | - Lower Bearing    |
| - D/P Switch    | - Controller Board |

### 6.2 Spare Parts List

See filter cutaway on page 17.

## APPENDICES

### Appendix I Special Construction and Features

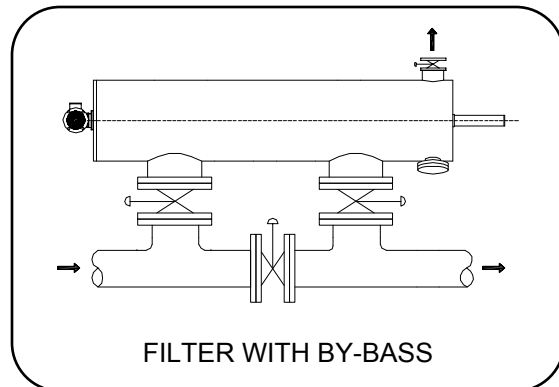
#### I. (AUTOMATIC) BY-PASS

Sometimes it is necessary to have flow even when the filter is out of service for periodical maintenance. In this situation, it is recommended to create a by-pass.

##### FILTER WITH BY-PASS

It is very simple to create a by-pass, especially for the on-line models. To do so, add a block valve on both the inlet and outlet and a bypass with another block valve (see drawing).

If the by-pass valves are provided with actuators, it can be converted to an automatic by-pass system by wiring it to the control box ( see controller manual).



#### II. ASME CERTIFIED FILTERS

ASME certified filters for the LPF series are available on special order. The lead time on these is approximately 30 to 90 days.

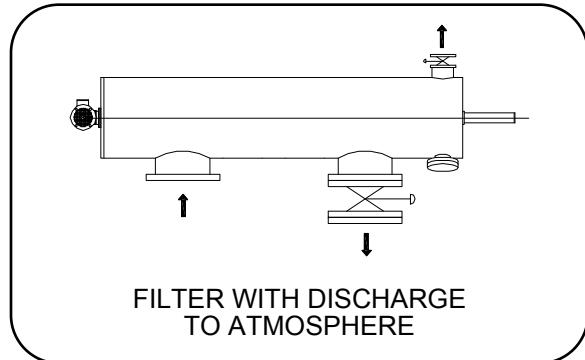
#### III. FILTERS FOR SEVERE APPLICATIONS

The LPF series filters are available in stainless steel construction or other special alloys for severe applications. Filters with corrosion resistant coatings are also available. Consult with manufacturer for availability.

## Appendix II System with Discharge to Atmosphere

If the filter freely discharges to the atmosphere, it is recommended that a control valve be installed at the filter discharge. Depending on the process upstream of the filter, the flow may be higher than the filter handling capacity. In this case, the control valve at the outlet would be used to create a back pressure on the system and control the flow across the filter.

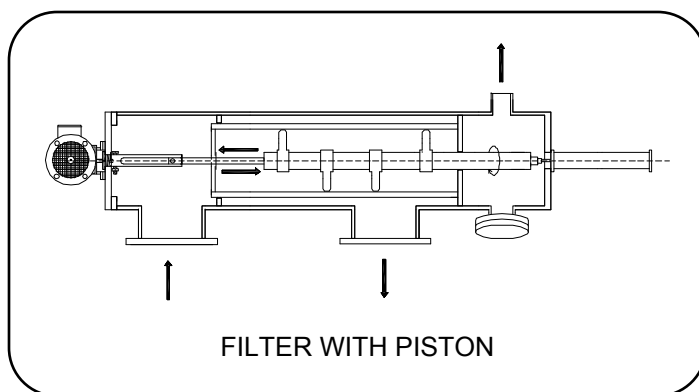
In addition, the discharge valve can be used as a pressure sustaining valve in cases where pressure (> 15psi) is not adequate during backwash.

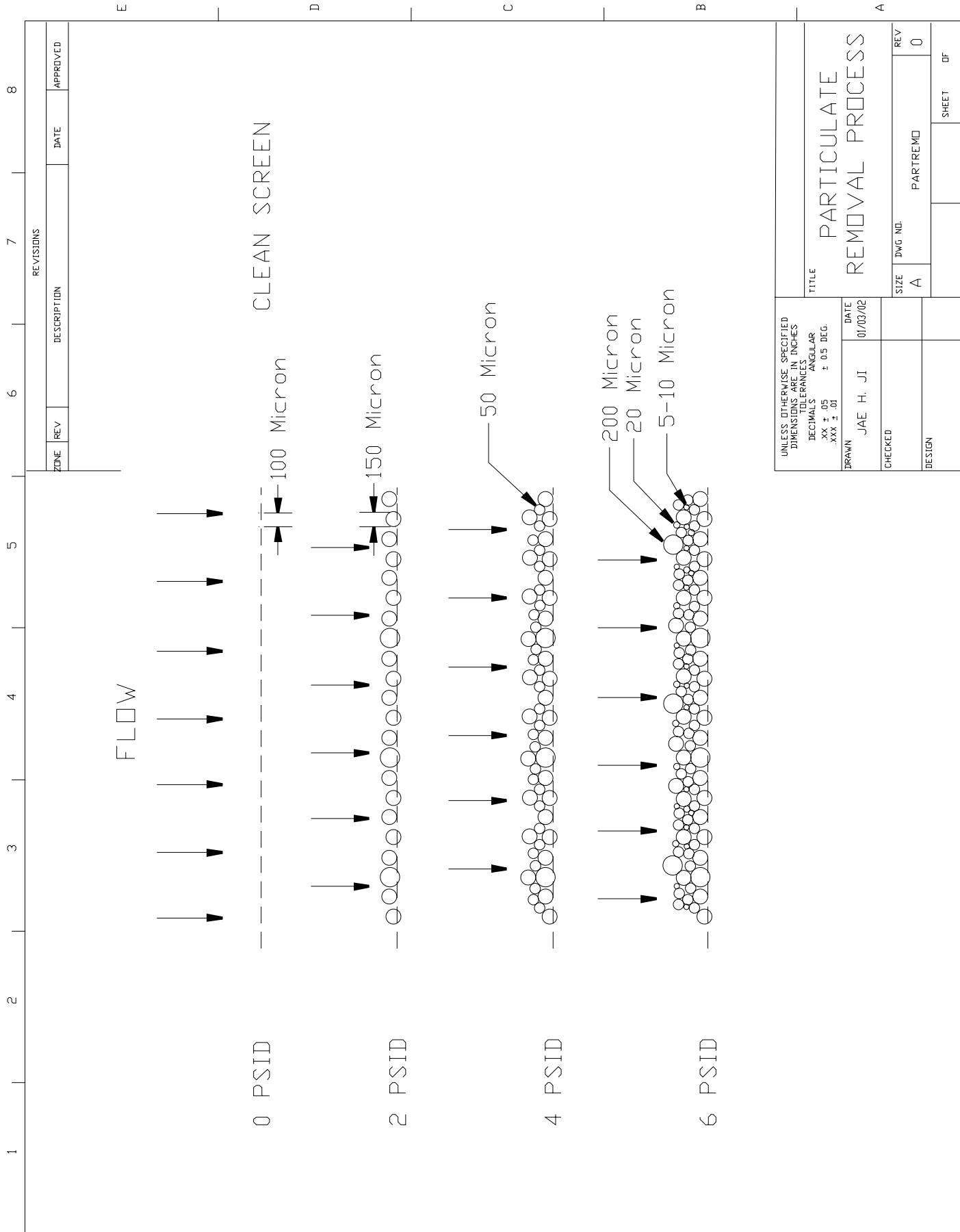


## Appendix III Piston

Due to longer screens on larger filters, it is necessary to employ a piston for the cleaning mechanism. The piston is used to move and control the linear velocity of the dirt collector during the rinse cycles. This would enable the dirt collector to clean the entire surface area of the screen in a spiral-downward movement.

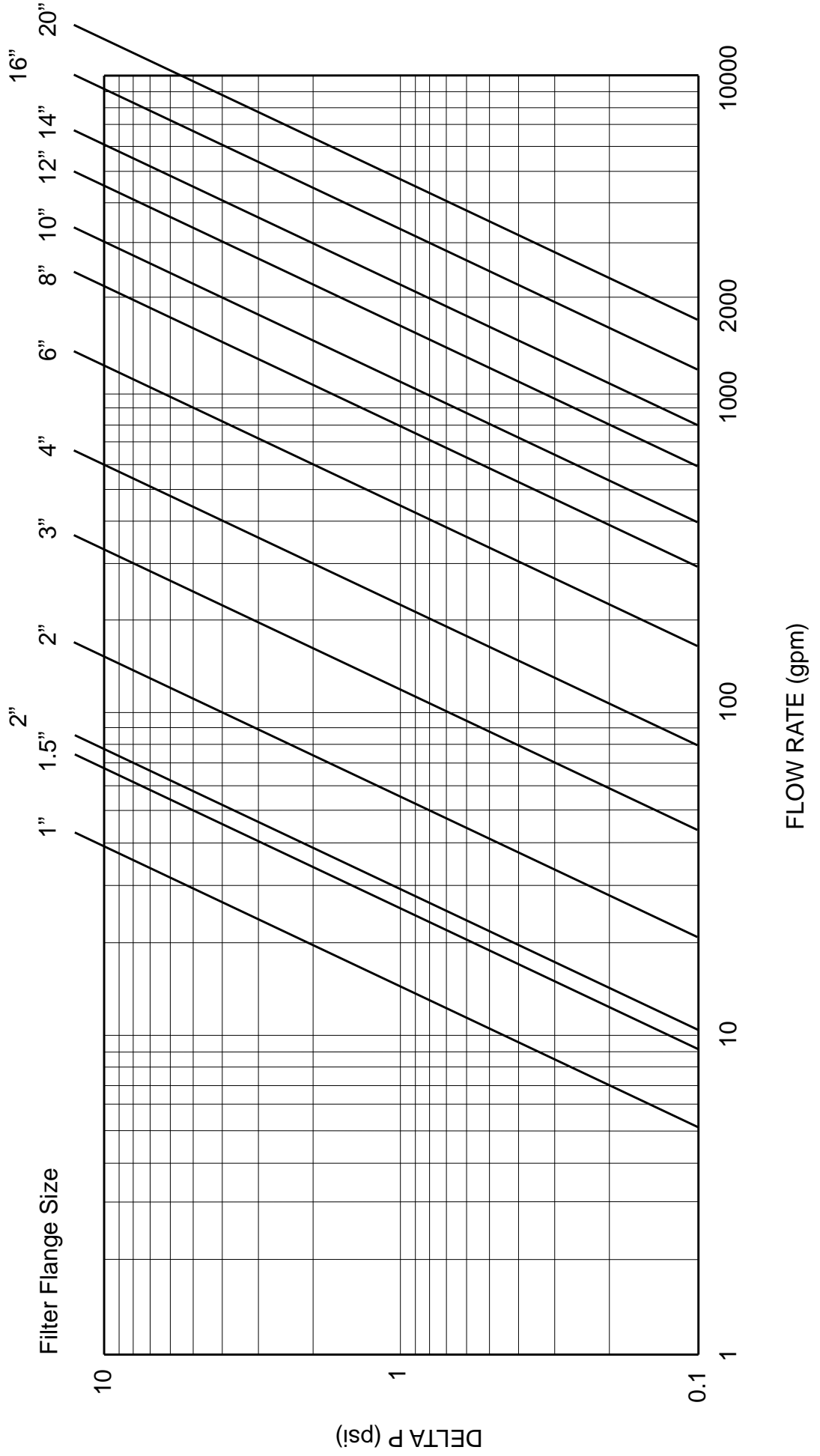
At the end of the cleaning cycle, the flush valve closes and the normal filtration process resumes. At the same time, the piston is energized with water pressure which pushes the dirt collector back into position for the next rinse cycle.

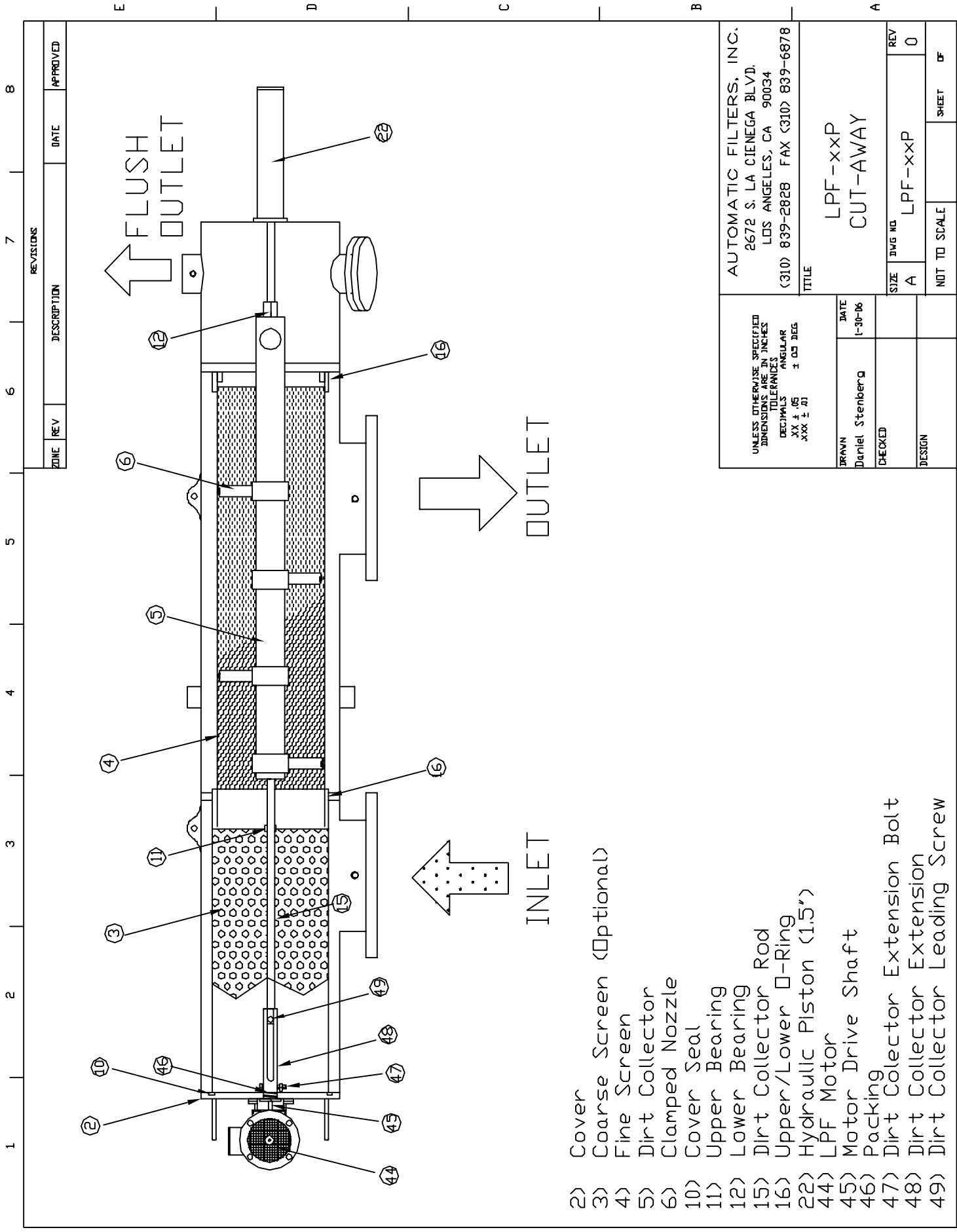




UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES DECIMALS ANGULAR XX ± .05 XXX ± .01		TITLE PARTICULATE REMOVAL PROCESS	
DRAWN JAE H. JI	DATE 01/03/02	SIZE A	REV 0
CHECKED		DWG NO.	PART/REV 0
DESIGN			SHEET OF

# PRESSURE DROP DATA



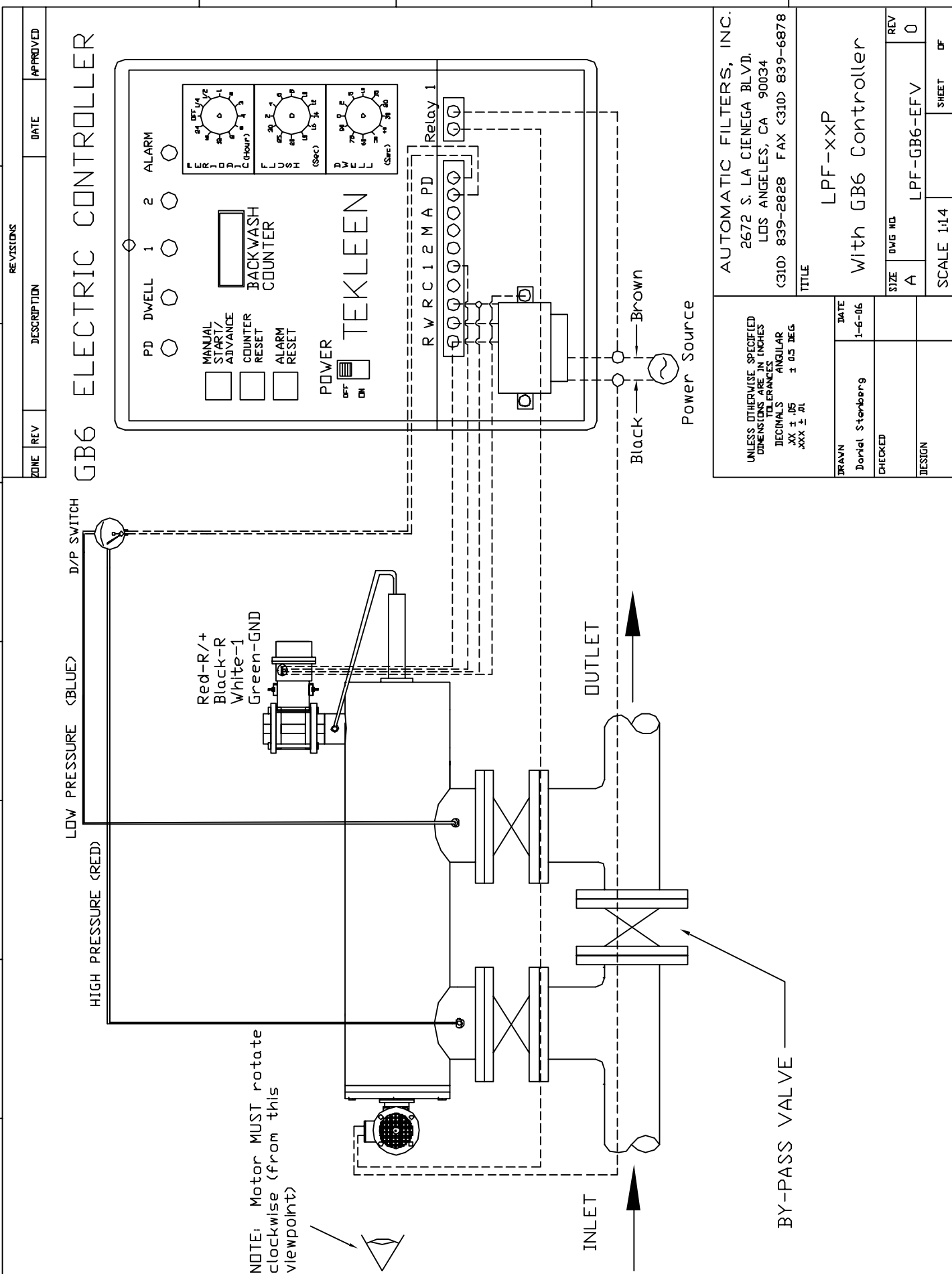


REVISIONS		DATE	APPROVED
ZONE	REV	DESCRIPTION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES DECIMALS XX ± .05 .XXX ± .01		DATE 1-30-06
DRAWN Daniel Stenberger	CHECKED  	DESIGN  
AUTOMATIC FILTERS, INC. 2672 S. LA CIENEGA BLVD. LOS ANGELES, CA 90034 (310) 839-2828 FAX (310) 839-6878		
TITLE LPF-xxP CUT-AWAY		
SIZE A	DWG NO LPF-xxP	REV 0
NOT TO SCALE		SHEET OF

- 2) Cover
- 3) Coarse Screen (Optional)
- 4) Fine Screen
- 5) Dirt Collector
- 6) Clamped Nozzle
- 10) Cover Seal
- 11) Upper Bearing
- 12) Lower Bearing
- 15) Dirt Collector Rod
- 16) Upper/Lower O-Ring
- 22) Hydraulic Piston (1.5")
- 44) LPF Motor
- 45) Motor Drive Shaft
- 46) Packing
- 47) Dirt Collector Extension Bolt
- 48) Dirt Collector Extension
- 49) Dirt Collector Leading Screw

1 2 3 4 5 6 7 8



REVISIONS		DATE	APPROVED
ZONE	REV	DESCRIPTION	

# GB6 ELECTRIC CONTROLLER

MANUAL START/ADVANCE COUNTER  
 BACKWASH COUNTER  
 ALARM RESET

PD DWELL 1 2 ALARM

POWER  
 OFF ON

RELAY 1  
 R W R C 1 2 M A P D

TEKLEEN

UNLESS OTHERWISE SPECIFIED  
 DIMENSIONS ARE IN INCHES  
 DECIMALS ANGULAR  
 XX ± .05  
 XXX ± .01

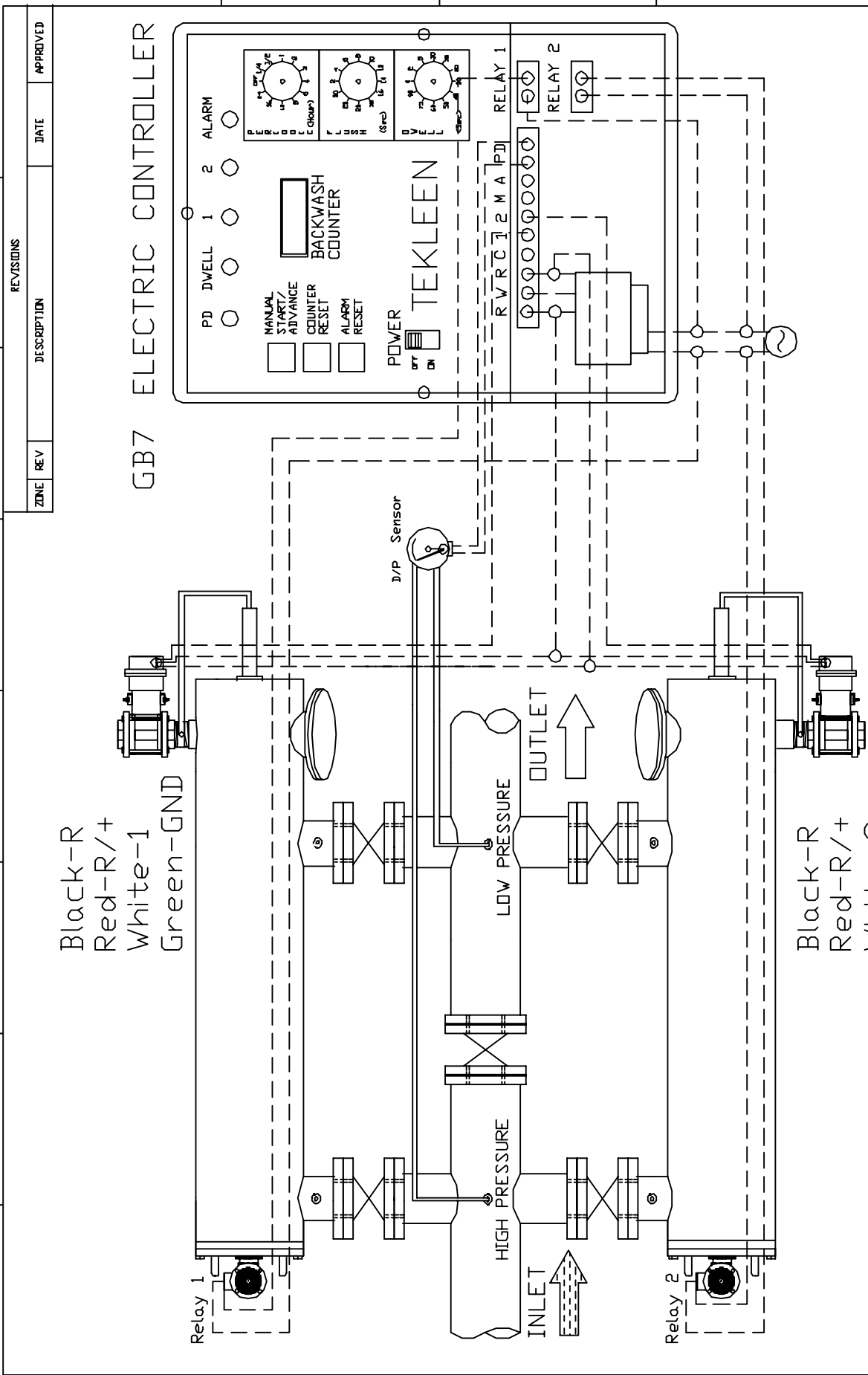
AUTOMATIC FILTERS, INC.  
 2672 S. LA CIENEGA BLVD.  
 LOS ANGELES, CA 90034  
 (310) 839-2828 FAX (310) 839-6878

TITLE  
 LPF-xxP  
 With GB6 Controller

DATE	1-6-06
DESIGN	
CHECKED	
DRAWN	Daniel Sternberg

SIZE	A	DWG NO.	LPF-GB6-EFV	REV	0
SCALE	1:1.4	SHEET	OF		

1 2 3 4 5 6 7 8



Black-R  
Red-R/+  
White-1  
Green-GND

Black-R  
Red-R/+  
White-2  
Green-GND

REVISIONS		DATE	APPROVED
ZONE	REV	DESCRIPTION	

# GB7 ELECTRIC CONTROLLER

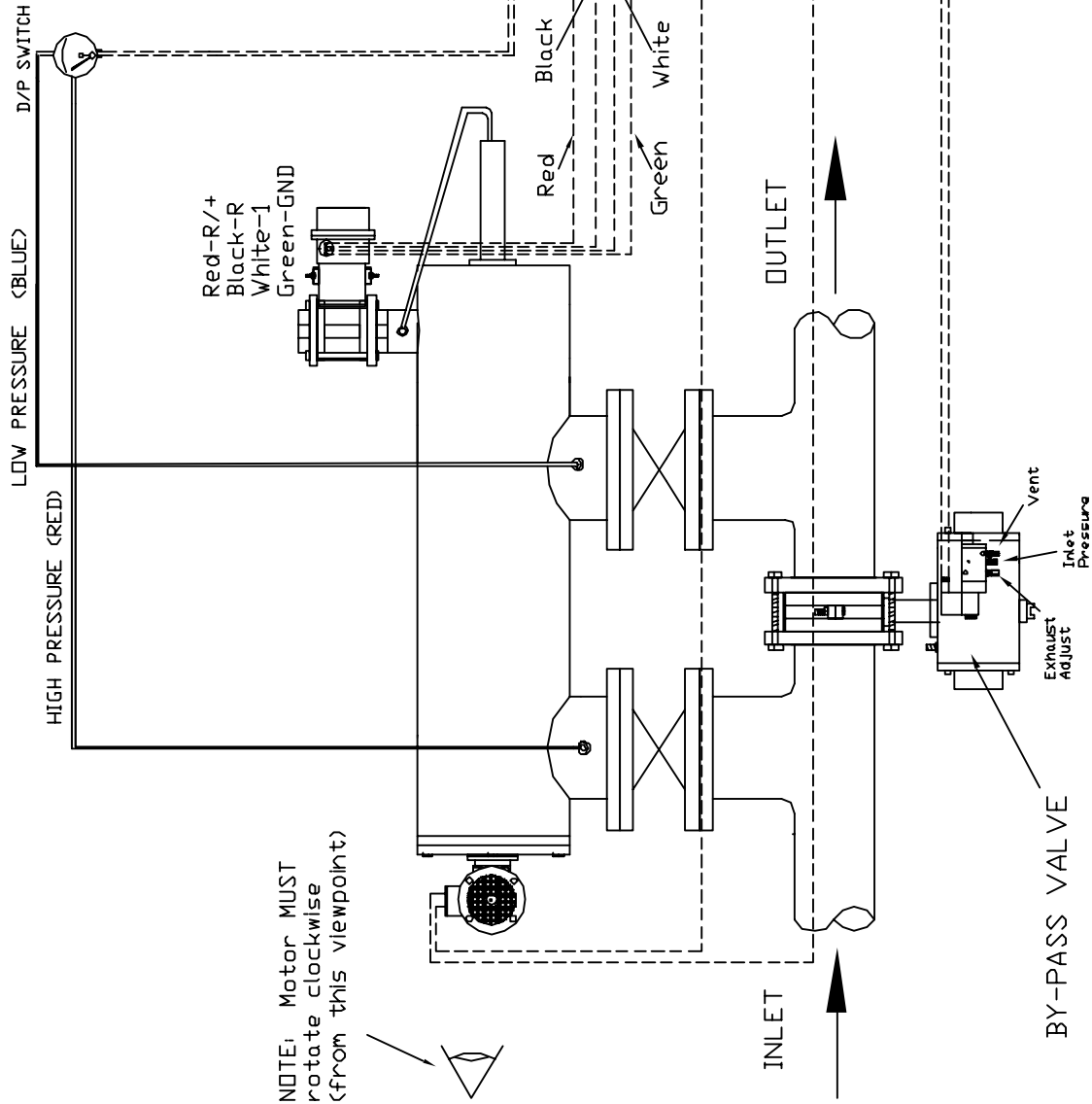
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES		AUTOMATIC FILTERS, INC.	
DECIMALS	ANGULAR	TITLE	
XX ± .05	± 0.5 DEG	Two LPF Filters in Parallel	
XXX ± .01		SIZE	DWG NO
		A	2 LPF
		CHECKED	REV
		Daniel Stenborg	0
		DATE	
		1-12-06	
		DESIGN FOR	SHEET
			OF



1 2 3 4 5 6 7 8

REVISIONS		DATE	APPROVED
ZONE	REV	DESCRIPTION	

# GB6 ELECTRIC CONTROLLER



UNLESS OTHERWISE SPECIFIED  
DIMENSIONS ARE IN INCHES  
DECIMALS ANGULAR  
XX ± .05  
XXX ± .01

DATE 10-18-05  
DRAWN Daniel Sternberg  
CHECKED  
DESIGN

AUTOMATIC FILTERS, INC.  
2672 S. LA CIENEGA BLVD.  
LOS ANGELES, CA 90034  
(310) 839-2828 FAX (310) 839-6878

TITLE LPF-xxP  
With GB6 Controller  
Bypass Valve

SIZE A	DWG NO. LPF-GB6-EFV	REV 0
SCALE 1:14		SHEET 0F

## **WARRANTY**

Automatic Filters, Inc. (AFI) warrants its filters and controllers to be free from original defects for one year from the date of original sale. The manufacturer will replace, free of charge, any part found defective under normal use and service within the guarantee period, provided the product is installed, used, and maintained in accordance with good engineering practice and all applicable instructions or limitations issued by AFI. The manufacturer assumes no liability for incidental or consequential damage sustained in the adoption or use of our engineering data, service, or products. Liability is limited to the repair or replacement of the products. No agent or representative of AFI has the authority to waive or add to this agreement. Altered products or use of products in a manner not intended shall void this warranty. All warranty claims must be sent along with the defective product, freight prepaid to AFI at its business address. All warranty shipments are for the account of the buyer. The warranty period shall be 12 months from the date of shipment to the client.