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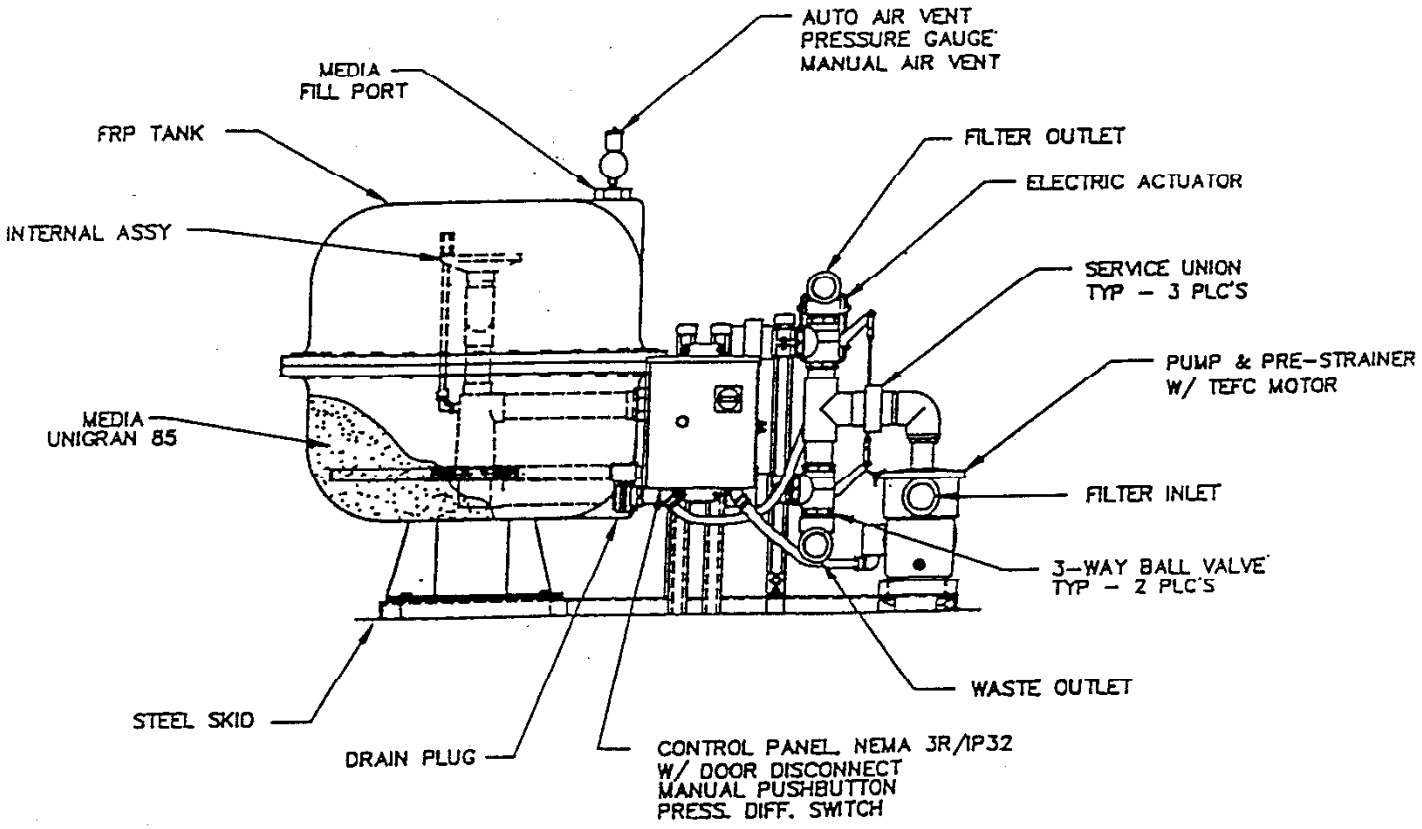
MAIN MENU

SMF–FG INSTALLATION, OPERATION & MAINTENANCE MANUAL.



process efficiency products, inc.

322 Rolling Hills Road•Mooresville, NC, 1(800)24-Filters•(704)662-3133•Fax(704)662-3155

pep process efficiency products inc.

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Process Efficiency Products filtration equipment has been designed to give long, trouble-free service when properly installed, operated and maintained. This manual is a guide to establishing installation procedures and a maintenance program. IT IS IMPORTANT THAT MAINTENANCE PERSONNEL REVIEW THIS MANUAL CAREFULLY - INCLUDING THE SAFETY PRECAUTIONS AND WARNINGS LOCATED ON PAGE 9 PRIOR TO PERFORMING ANY REPAIRS OR MAINTENANCE ON THE INDUSTRIAL WATER FILTER.

Included in this manual are the recommended procedures for installation, start-up, operation and shutdown for the PEP Industrial Water Filters. Note that the recommendations on frequency of service are minimums, and where operating conditions are severe, the service should be performed more often. For each required service, follow the procedures outlined under the Maintenance Procedures section of this manual. The PEP Industrial Water Filter construction details are shown on the cover with the major points of inspection and service identified. If you need further information that is not covered in this manual, please contact your local PEP Representative or the PEP factory.

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GENERAL DESCRIPTION

The PEP SMF-FG Series Industrial Water Filters are permanent media type units specifically designed to clean industrial and process water. The PEP SMF-FG filters are designed for sidestream or in-line applications on non-pressurized systems. The filter tanks on the SMF-FG is standardly equipped with 50/350 psi/kpa.

FILTER OPERATION

Water from the system is pumped through the overdrain assembly at the top of the filter tank and distributed evenly over the media. Suspended particles are trapped in the filter media. The filtered water then passes from the vessel through the underdrain assembly at the bottom of the filter and returns to the system.

When the trapped particles cause the pressure differential across the media bed to reach a pre-determined pressure of approximately 10 psi over starting gauge pressure, the valves are automatically or manually repositioned and the media is backwashed. The media is backwashed with a rigorous scouring action and the trapped particles are released. The dirty water passes from the filter tank through the overdrain assembly at the top of the vessel and is flushed to the drain. When the media is cleaned after a preset time (3 minutes standard), the valves are again repositioned and the filtration cycle is continued.

INSTALLATION

★ UNPACKING

When the PEP Industrial Water Filter is delivered to the jobsite, it should be checked thoroughly to ensure that all required items have been received and the filter equipment is free of <u>any shipping damage prior to signing the bill of lading.</u>

The model number of the filter will appear on a nameplate located on the unit and should be checked against the invoice/packing list. Table 1 (page 11) shows the parts which should be inspected when the unit is unpacked.

★ RIGGING

1. The PEP SMF-FG units should be lifted with a forklift or overhead crane. If these units are lifted with an overhead crane, lifting straps must be located below the filter skid and should not come in contact with the filter components.

2. All PEP Industrial Water Filters should be rigidly anchored to the floor or support steel by means of anchor bolts. The SMF-FG has holes suitable for 1/2"/13mm anchor bolts.

3. After the unit is installed at a permanent location, the pressure gauge and air relief valves should be installed on the top of the filter tank (some units will have vents already installed). The sand media should be loaded into the filter at this time. Refer to loading media section (Table 6, page 11) for a description of how to load the media into the filter tank and the quantity of media necessary for each filter size.

★ PIPING

The PEP SMF-FG filter should be installed as follows (refer to Table 2, page 11 for connection sizes on filter models):

*1. Connect a feed water line from the system sump or piping to the connection labeled "**INLET**"on the pump. If the inlet connection is located above the operating water level of the system sump, install a foot/check valve to prevent loss of suction on the pump.*

*2. Connect the return line from the connection labeled "**OUTLET**" to the system sump or piping.*

*3. A service valve should be installed on the inlet, outlet, and city water line (if city water is used) to allow servicing of the filter. For units using a backwash source other than the system sump, use Table 3, page 11 to determine required backwash flow. Connect this line to the connection labeled "City Water". **The maximum city water backwash supply pressure on the SMF filters should never exceed the pressure rating of the filter vessel.** If public or municipal water is used for backwash, a backflow preventer or check valve is required in the line on all units (**check standard local codes**).*

*4. Connect a backwash waste line to the connection labeled "**WASTE**". This line carries the backwash waste water to the drain. **Do not put a valve in the waste line !!!** Refer to Table 3, page 11 for the minimum and maximum backwash flow rates. **Note:** If the drain is not large enough to handle the volume of water during backwash, it may be necessary to use a storage tank to collect the waste water. A valve can be used to regulate the flow from tank at a suitable rate to the drain. **NEVER REDUCE THE SIZE OF WASTE WATER LINE.***

5. All interconnecting piping, fittings, valves, or other accessories connected to the filter system (whether supplied by PEP or others) must be independently supported to eliminate stress on piping.

Check with local, county, or other government authorities to ensure compliance with applicable government industry requirement codes.

NOTES: 1. SMF-FG models media drain plug (1.5"/40mm) is located at the bottom of the tank.

★ ACTUATOR REQUIREMENTS

The PEP SMF-FG filters utilize electric actuators to control the valve action between the filtration and backwash modes. The electric actuator is designed for 110 volt control.

★ LOADING THE FILTER MEDIA

The special spherical silica sand media used in all PEP Industrial Water Filters is designed to remove up to 90% by volume of the suspended solids 10 micron and larger. The media will ship to the jobsite in .5 cu.ft. drums or in 1 cu.ft. bags for easy handling during the media loading process.

*1. **NEVER LOAD MEDIA INTO A DRY FILTER TANK**, fill tank one-third full with water before loading (refer to PEP's media book for installation). Always check filter internals BEFORE loading media (Page 11).*

★WIRING

PEP Industrial Water Filters supplied with a pump and automatic backwash controls are provided with the following as standard: NEMA 3R/IP32 control cabinet containing an on/off disconnect switch, motor overload protection, transformer to provide 110v control voltage, backwash timer, 24 hour time clock, pressure differential switch to initiate backwash, valve actuator to reposition valves for backwash, and push button for manual backwash initiation. Units are provided with <u>requested</u> voltage/phase (460 volt, three phase standard).

Units supplied with city or other source backwash are provided with a magnetic motor starter. Units supplied as manual are provided with no motor control of any kind.

THE FOLLOWING RECOMMENDATIONS CONFORM TO THE 1993 NATIONAL ELECTRIC CODE. CHECK WITH LOCAL, COUNTY, OR OTHER GOVERNMENT AUTHORITIES FOR PRESCRIBED REQUIREMENTS. NOTE: CHECK FILTER PUMP NAMEPLATE FOR HORSEPOWER AND AMP DRAW

Single Phase Manual Units

1. Install a separate power supply line with circuit breaker protection between the closest branch distribution panel and the pump motor. The full load current for standard models is listed in Table 4, page 11.

2. Install an externally operated switch with fuse protection and door interlock in plain sight of the filter and not more than 50ft/15m away. The thermal overload protection, if required, must be sized for full load amp draw listed on the pump motor name plate.

Three Phase Manual Units

1. Install a separate power supply line with circuit breaker protection between the closest branch distribution panel and the pump motor. The full load current for standard models is listed in Table 5, page 11.

2. Install a service disconnect switch in plain sight of the filter and not more than 50ft/15m away.

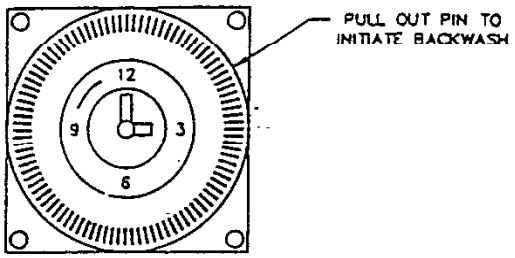
3. Install an externally operated manual or magnetic starter with thermal overload and fuse protection. If the unit is to be controlled remotely with a time clock, switch, or other device, a magnetic starter must be used. The thermal overload protection, if required, must be sized for the full load amp draw listed on the pump motor nameplate.

Single and Three Phase Automatic Units

1. Install a separate power supply line with circuit breaker protection between the closest branch distribution panel and the control box. The full load current for standard single and three phase units is listed in Table 4 & 5, PAGE 11. The control box contents are prewired and include a service disconnect switch, thermal overload/short circuit protection, a transformer to convert the power supply to single phase 110v for controls. Wire the power supply lines to the disconnect switch. **ALL INCOMING POWER SUPPLY LINES MUST CONNECT TO DOOR INTERLOCK DISCONNECT.**

24 HOUR/7-DAY TIME CLOCK

The 24 hour time clock is used to initiate the 3 minute backwash timer relay at any specified time in the day. The 24 hour backwash clock comes preset from the factory to backwash once every 24 hours of running time. For every non-consecutive pin pull-out in a 24 hour cycle the filter will backwash. Each pin represents 15 minutes of a 24 hour period. The filter can only backwash once every 1/2 hour by time clock. For every pin pull-out consecutively, the filter will backwash once and then lock itself out for 15 minutes x the number of pins pulled out. The 7day time clock is used to initiate the 3 minute backwash timer relay on any hour at any specific time and day of the week. The 7-day timer will be preset from the factory to backwash once a week. The 7 day timer works the same as the 24 hour clock except each pin represents 2 hours.



24 HOUR TIME CLOCK

OPERATION AND MAINTENANCE

★ INITIAL AND SEASONAL START-UP

Before initial start-up or after a shut-down period, the PEP Industrial Water Filter should be thoroughly inspected and cleaned. CAUTION: Perform the first five of the following recommendations with the electric power off. Refer to the Safety Precautions on Page 9, regarding the safeguarding of Maintenance Personnel from biological contaminants, prior to Initial and Seasonal Start-Up.

1. On PEP SMF-CS filters, loosen the clamp around the pump prestrainer tank lid. Remove the lid, inspect the o'ring seal and lubricate. Clean debris from the pump prestrainer basket. Replace the basket, lid and clamp (now is a good time to prime the pump suction line).

2. Turn the pump and motor shaft by hand to ensure free rotation (if possible).

3. On manual systems only, rotate the valves manually by moving the valve linkage up and down to ensure free operation. Make sure the valves and linkage are in the correct position before start-up.

4. On PEP filters, loosen the access bolts on access port lid, remove lid and lubricate the bolts as necessary.

5. Inspect the overdrain assembly and media pack. If the media pack is contaminated, remove the foreign material or replace the media. Replace the access port.

6. Open manual air relief valve on top of the filter tank. Start the pump motor briefly and check the arrow on the pump volute for proper rotation. Turn the pump motor off. Do **NOT** operate the pump for an extended period of time with the pump rotating backwards. Have a qualified electrician change leads to correct rotation.

7. With the air relief valve open on top of the filter tank. Check the shut-off valves in the filter inlet and outlet water lines to verify they are open. Make sure the pump is primed. Start the pump and fill filter vessel. Wait for all the air in vessel to be released before closing manual air relief valve.

8. Check the voltage and current of all leads on the pump motor. The current amp draw should not exceed the nameplate rating.

9. Check the unit for any unusual noise or vibration and contact your local PEP Representative if noise or vibration occurs.

10. Check the unit for any air or water leaks. **All air leaks must be found and repaired.** Failure to do so could result in poor performance and/or personal injury.

11. Backwash the filter. After backwashing the filter, check the pressure gauge on top of the filter tank and record the clean media operating pressure gauge. The media should be backwashed whenever the pressure drop across the filter reaches approximately 10 psi over starting pressure.

★AFTER FIRST HOUR OF OPERATION

1. Open the air relief valve on top of the filter tank. Close the valve after the air has been purged from the system. Excessive air release represents a leak, which must be repaired. Air accumulation in the filter tank can result in an unsafe condition due to excessive pressure within the tank.

2. Check the unit for any unusual noise or vibration and contact your local PEP Representative if noise or vibration occurs.

3. Check unit for any air or water leaks.

★OPERATION

During operation, the PEP Industrial Filters should be inspected, cleaned and lubricated on a regular basis. The required services and recommended frequency (minimum) for each are summarized on Page 10 of this manual.

★COLD WEATHER OPERATION

PEP Industrial Water Filters that will be exposed to below freezing ambient temperatures require protection to prevent freezing. Installation in a heated indoor space is the best means of preventing the water from freezing in a filter. Where indoor installation is impractical because of filter location or space limitation, supplementary heat must be supplied through the use of electrical heater tape and insulation. The parts of the filter that must be heat traced and insulated are: prestrainer tank, pump, piping, valves, pressure switch tubing, and filter tank. The unit should be drained when it is to be shut down for any period of time. Refer to the Seasonal Shutdown section of the manual for recommendations.

★SEASONAL SHUTDOWN SMF-FG

The following services should be performed when the unit is to be shut down for a prolonged time period.

1. *Shut off all electrical power..*

2. *Close the shut-off valves in the filter inlet and outlet water lines. For units using a backwash source other than the system, close the shut-off valve in the line from that source also.*

3. *Drain all external piping to and from the filter.*

4. *Open the manual vent valves and open the drain line to the filter tank and piping. After the water has drained, close the drain and vent.*

5. *On manual units only, rotate the valves manually by moving the linkage up and down to ensure operation without obstruction.*

6. *Loosen the bolts around the circumference and remove the lid. Lubricate the bolt if necessary. Replace the o'ring if necessary.*

7. *Inspect the overdrain assembly and media pack. If the media is contaminated, remove the foreign material and replace the media if necessary. Replace the filter lid and secure the bolts.*

MAINTENANCE PROCEDURES

PUMP PRESTRAINER

***Warning:** Disconnect all electrical power prior to performing pump maintenance. The filter prestrainer basket on the pump inlet must be kept clean and free of debris. Shut off the power, close the valves, open air relief valve, remove bolts and lid. Remove the basket and remove foreign material. Replace basket, lubricate o'ring, and tighten clamp (see pump drawing, page 13).*

PUMP

***Warning:** Disconnect all electrical power prior to performing pump maintenance. Turn the pump shaft by hand. The impeller should spin freely. If not, remove the prestrainer from the volute and check with a feeler gauge. The clearance between the impeller and volute face is 0.015"/0.38 mm. Adjust the clearance, if necessary, by loosening the set screws. The impeller and motor shaft are spring loaded and will slide forward/back. Adjust the impeller to proper clearance and tighten set screws. If the impeller remains obstructed, remove the 4 bolts holding the volute to the motor bracket and impeller, and inspect the volute for foreign material. Reverse the above procedures for replacement.*

★BACKWASHING

The media pack must be backwashed whenever the debris build-up increases 10 psi over the starting pressure gauge reading. Since the units with automatic controls perform this function as necessary, a detailed backwash procedure is only given for manual units. However, automatic units can be manually backwashed by pushing the button on the control panel unit the valves change position. The valves will then be automatically repositioned after three minutes. PEP filters should be backwashed once a week minimum.

For manual control units using a backwash water source other than the system:

1. *Shut off the electrical power to the pump motor.*
2. *Move the handle on the linkage to position the valves in backwash mode.*
3. *Allow the filter to backwash for approximately three minutes.*
4. *Move the handle on the linkage to position the valves in the filtration mode.*
5. *Re-start the pump motor.*

For manual control units using the system water for backwash:

1. *Shut off the electrical power to the pump motor.*
2. *Move the handle on the linkage to position the valves in the backwash mode.*
3. *Re-start the pump motor.*
4. *Allow the filter to backwash for approximately three minutes.*
5. *Shut off the electrical power to the pump motor.*
6. *Move the handle on the linkage to position the vales in filtration mode.*
7. *Re-start the pump motor.*

★ *FILTER TANK*

The filter tank internal components should be visually inspected annually or whenever backwashing does not reduce the pressure of the filter tank to the starting media gauge pressure. On the SMF-FG filters, remove the lid on the top of the tank to inspect the internal components. Note: Always use care and follow proper shutdown procedures. Inspect the overdrain assembly for any debris blockage or damage and clean or replace if necessary. Remove and inspect the media. The SMF-FG filters have a 1.5"/40mm drain plug located on the bottom of the tank for easy removal of the media and inspection of the underdrain assembly. Over a period of time, foreign matter may become imbedded in the media pack which cannot be backwashed out. Contaminated media should be discarded. Unscrew the underdrain laterals and inspect for blockage or damage. Clean or replace if necessary. Refill tank with the proper amount of uncontaminated media, following media loading instructions (Table 6, Page 11).

WATER TREATMENT

Filtration is an effective way of reducing the level of contamination in a system but is only one component of a water treatment program. Dissolved solids originally present in water remaining after evaporation cannot be eliminated by filtration. The concentration of these dissolved solids increases rapidly and can cause scale and corrosion. In addition, airborne impurities and biological contaminants, including Legionella, may be introduced into the recirculating water through the cooling equipment being filtered.

To control all potential contaminants a water treatment program must be employed. In many cases a simple bleed-off in the system may be adequate for control of scale and corrosion. The filter backwash can be used to constitute a portion of the bleed. However, biological contamination can be controlled through the use of biocides and such treatment should be initiated at system start-up and continued regularly thereafter.

For specific recommendations on water treatment contact a competent water treatment supplier.

FACTORY AUTHORIZED PARTS

PEP maintains a stock of replacement parts. Shipments of these parts is normally within three days after receipt of an order (provided the item is in stock). In emergency situations, shipment can usually be made within 24 hours (if stock). Be sure to include the unit serial number and model when ordering parts.

To facilitate servicing the unit, it is suggested that the following parts be carried on hand:

1. O'ring or gasket for filter tank access port, handhole and manhole gaskets.
2. O'ring seal or gasket for pump prestainer lid (if applicable).
3. Seal kit for pump (if applicable).
4. Transformer fuse (automatic units only).
5. Replacement media.

SAFETY PRECAUTIONS

✓ All electrical, mechanical and rotating machinery constitute a potential hazard, particularly for those not familiar with its design, construction, and operation. Accordingly, adequate safeguards (including use of protective enclosures when necessary) should be taken with this equipment both the safeguard the public (including minors) from injury and to prevent damage to the equipment, its' associate system and the premises

✓ The operation, maintenance and repair of this equipment should be undertaken only by personnel qualified to do so. All such personnel should be thoroughly familiar with the equipment, the associated system and controls, and the procedures set forth in this manual. Proper care, procedures, and tools must be used in handling, lifting, installing, operating, maintaining, and repairing this equipment, to prevent personal injury and/or property damage.

✓ For the protection of authorized service and maintenance personnel, the pump motor associated with this equipment should be installed with a lockable disconnect switch located in close proximity and within sight if the Industrial Water Filter. No service work should be performed on or near the pump motors, without first ensuring that the pump motor has been electrically disconnected and locked out.

✓ The recirculating water system may contain chemicals or biological contaminants which could be harmful if inhaled or ingested. Accordingly, personnel who may be exposed directly to the mists produced by water jets or compressed air (should these be used to clean portions or components of the Industrial Water Filter) should wear half-face respirators with HEPA filter cartridges, NIOSH/MSHA approved number TC-21C-142/TC-21C-182.

WARRANTY POLICY

PEP warrants all products to be manufactured free from defects in material for a period of 14 months from the date of shipment. In the event of any such defect, PEP will repair or provide, at our option, a replacement (new or rebuilt at our option) free of charge. However, the warranty products or parts which prove to be defective will be F.O.B. our plant.

PEP WILL NOT PAY FOR ANY CHARGES FOR REPAIRS OR REPLACEMENTS WITHOUT AN AGREEMENT IN WRITING TO DO SO.
This warranty does not apply to any defect which can be attributed to have been caused by accident, alteration, abuse, misuse, or by acts of God, or by consumer negligence.

To obtain any needed repair or replacement of the product or part(s), you must issue a purchase order for the part(s). Upon return and vendor inspection of the defective material, a credit will be issued when/if PEP received credit from its; vendor. Note: The return of defective part(s) must be made within 30 days of the shipment or the invoice for part(s) will be considered due and payable. If the failure of the part(s) proves not to be a manufacturer's defect, the invoice will be considered due and payable.
This warranty applies only to parts. PEP will not be responsible for any labor, repair, or transportation to anywhere from it's factory or repair station.

OPERATION AND MAINTENANCE SCHEDULE

TYPE OF SERVICE	START-UP	MONTHLY	SEMI-ANNUALLY	SHUTDOWN	ANNUALLY
Inspect General Condition of Unit	✓	✓			
Check & Lubricate Clamp on Strainer Lid (SMF filters)	✓	✓		✓	✓
Clean Basket in Pre-Strainer Tank (SMF filters only)	✓	✓		✓	
Inspect O-ring Gasket (SMF)	✓			✓	
Check Pump Shaft for Free Rotation	✓	✓	✓		
Check Operation of Valves	✓	✓		✓	
Check, Lubricate Clamp on Filter Tank Access Port (HMF & BMF)	✓			✓	✓
Inspect Overdrain Assembly and Media Pack	✓			✓	✓
Check Pump Motor for Proper Rotation	✓				
Prime Pump	✓				
Check Motor Voltage & Current	✓	✓	✓		
Check Pressure Gauge Reading (Top of Filter Tank)	✓	✓			
Check Unit for Unusual Noise or Vibration	✓	✓			
Check Unit for Leaks	✓	✓			
Drain Filter and Piping				✓	

Table 1. Inspection Chart

Part	SMF-FG Model
Filter Tank	x
Valves & Linkage	x
Filter Inter-connecting Piping	x
Pump pre-strainer tank & basket	x
Pump	x
NEMA 3R Box (Automatic only)	x
Filter skid	x
Pressure gauge, air relief valves, & tees	x
Media (shipped loose)	x

Table 2. Connection Sizes

Model	System Water Backwash Tower Water			City Water Inlet
SMF-FG	Inches/ mm	Inches/ mm	Inches/ mm	Inches/ mm
20	2.0/50	1.5/40	1.5/40	1.5/40
24	1.5/40	1.5/40	1.5/40	1.5/40
30	2.0/50	2.0/50	2.0/50	2.0/50

Table 3. Filter Flow Rates

Filter Model SMF-FG	Forward Flow (GPM/LPS)	Min B/W Flow (GPM/LPS)	Max B/W Flow (GPM/LPS)
20	43 / 2.8	33 / 2.1	43 / 2.8
24	63 / 3.8	50 / 3.2	63 / 3.8
30	98 / 6.2	78 / 4.9	98 / 6.2

Table 4. Electrical Requirements Single Phase

PUMP HP / KW	Voltage 1⌀ 60HZ / 50HZ	Full Load Current (Amps)
1 / .75	115, 208, 220	16, 8.8, 8
2 / 1.5	115, 208, 220	24, 13.2, 12

Table 5A. Electrical Requirements Three Phase (60 Hz)

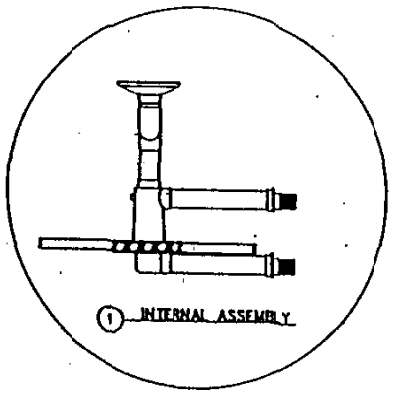
PUMP HP/ KW	Voltage 3⌀ 60 HZ	Full Load Current (Amps)
1 / .75	208,230,460,575	4.1,3.6,1.8,1.4
2 / 1.5	208,230,460,575	7.5,6.8,3.4,2.7

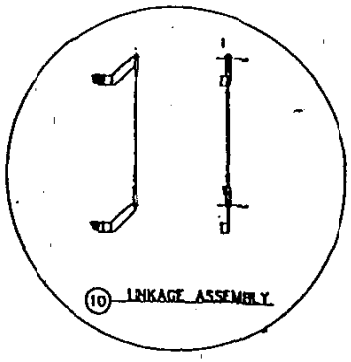
TABLE 5B. Electrical Requirements Three Phase (50 Hz)

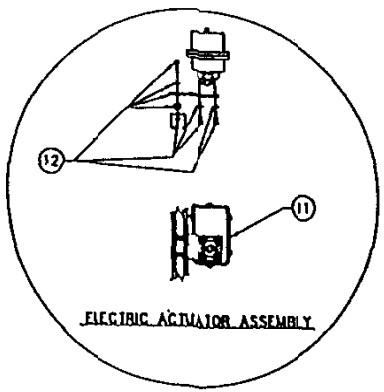
PUMP HP/ KW	Voltage 3⌀ 50 HZ	Full Load Current (Amps)
1 / .75	380, 415	1.7, 1.6
2 / 1.5	380, 415	3.4, 3.1
3 / 2.2	380, 415	5.2, 4.7

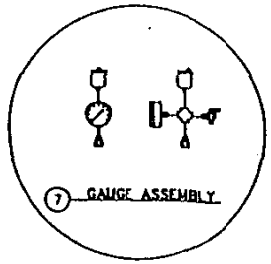
Table 6. Media Quantities: SMF-FG

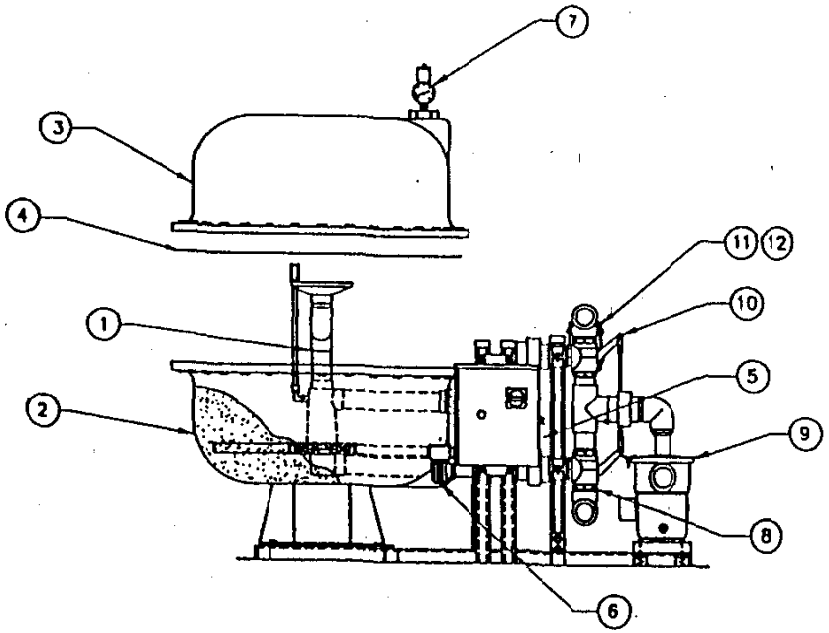
Filter Model SMF-FG	Standard 10 Micron Media (Drums)
20	4
24	5
30	8











12			A-X-0093	ELECTRIC ACTUATOR BRACKET KIT		
11			A-X-0093	ELECTRIC ACTUATOR		
10			A-S-0091	LINKAGE ASSEMBLY		
9			104-15-0385	MOTOR/PUMP/STRAINER ASSY		
8				3-WAY BALL VALVE (1 1/2" OR 2")		
7			A-S-0083	GAUGE ASSEMBLY		
6				PRESSURE SWITCH		
5			A-B-084A	ELECTRICAL PANEL ASSY		
4				TANK ASSEMBLY O-RING		
3				TANK ASSEMBLY (UPPER)		
2				TANK ASSEMBLY (LOWER)		
1				INTERNALS ASSEMBLY		
QTY REQD	CAGE CODE	PART OR IDENTIFYING NO.		NOMENCLATURE OR DESCRIPTION	MATERIAL SPECIFICATION	

PARTS LIST

APPLICATION

DO NOT SCALE DRAWING

CONTRACT NO

	APPROVED	DATE
DRAWN	H.G.	1-11-13
CHECKED		
ISSUED		

SWF-FG AUTO : PARTS ASSEMBLY

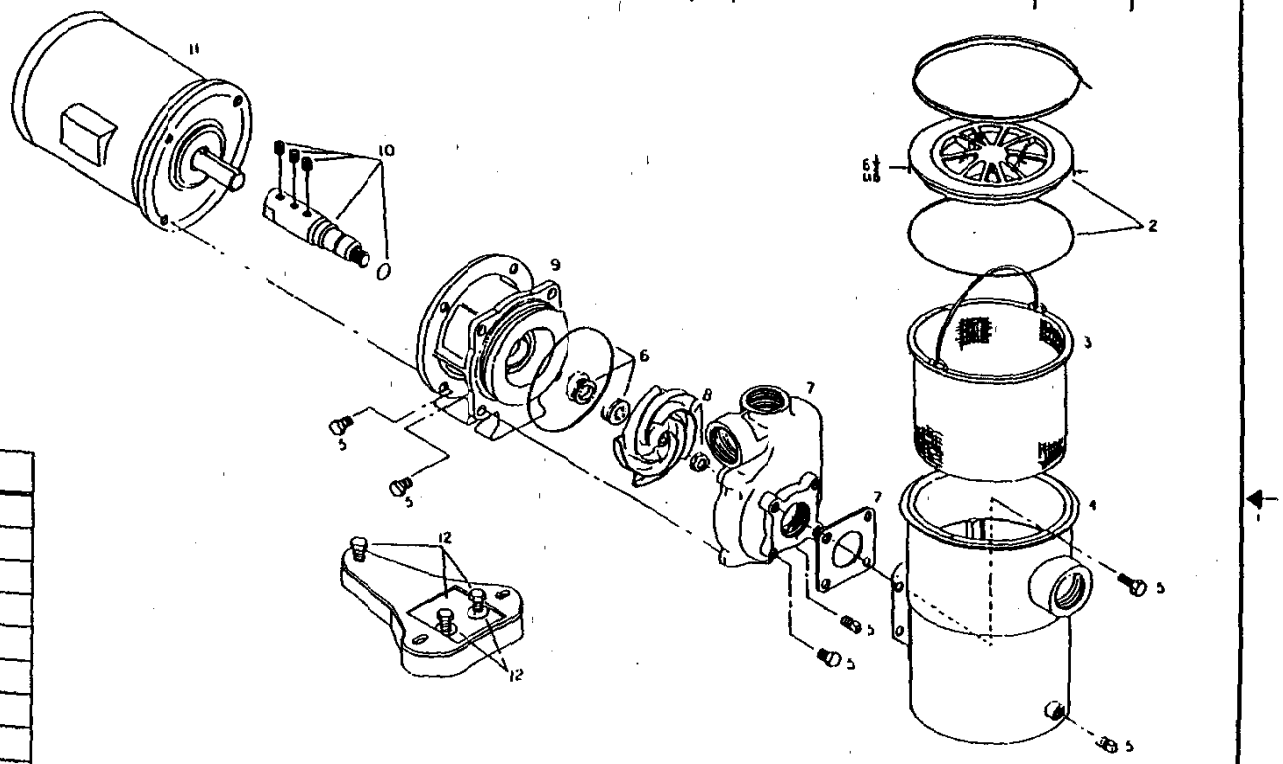
PSP

SIZE	CAGE CODE	DWG. NO.	REV
C		A-S-0644	

SCALE NONE SHEET 1 OF 1

MOTORS		
POWER	VOLTS	PHASE
1	110/220	1
1	230/460	3
1	380	3
1	550/575	3
2	110/220	1
2	230/460	3
2	380	3
2	550/275	3

KIT #	DESCRIPTION
1	LID CLAMP
2	LID WITH O-RING
3	PRE-FILTER BASKET
4	PRE-FILTER HOUSING
5	BOLT KIT PKG 12
6	SEAL KIT (PS 1000) WITH O-RING
7	BRASS VOLUTE WITH GASKET
8A	IMPELLER WITH NUT, 1/2 HP "5"
8B	IMPELLER WITH NUT, 1 HP "10"
8C	IMPELLER WITH NUT, 1 1/2 HP "15"
8D	IMPELLER WITH NUT, 2 HP "20"
9	PUMP MOTOR MOUNTING BRACKET
10	MOTOR STEP SHAFT WITH O-RING
11	MOTOR, SEE MOTOR SECTION
12	PUMP BASE PLATE WITH BOLTS



DWG. NO. | SH | REV.

REVISIONS

REV	DESCRIPTION	DATE	APPROVED

PARTS LIST

QTY REQD	CAGE CODE	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	MATERIAL SPECIFICATION

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE:
FRACTIONS ± | DECIMALS .XX ± .XXX ± | ANGLES ±

MATERIAL

FINISH

DO NOT SCALE DRAWING

CONTRACT NO.

APPROVALS		DATE
DRAWN	H.G.	9-28-93
CHECKED		
ISSUED		

NEXT ASSY | USED ON

APPLICATION

SMF PUMP PARTS ASSEMBLY : 6 1/2"

PEP process efficiency products

SIZE	CAGE CODE	DWG. NO.	REV.
B		104-1S-0385	

SCALE NONE | SHEET 1 OF 1