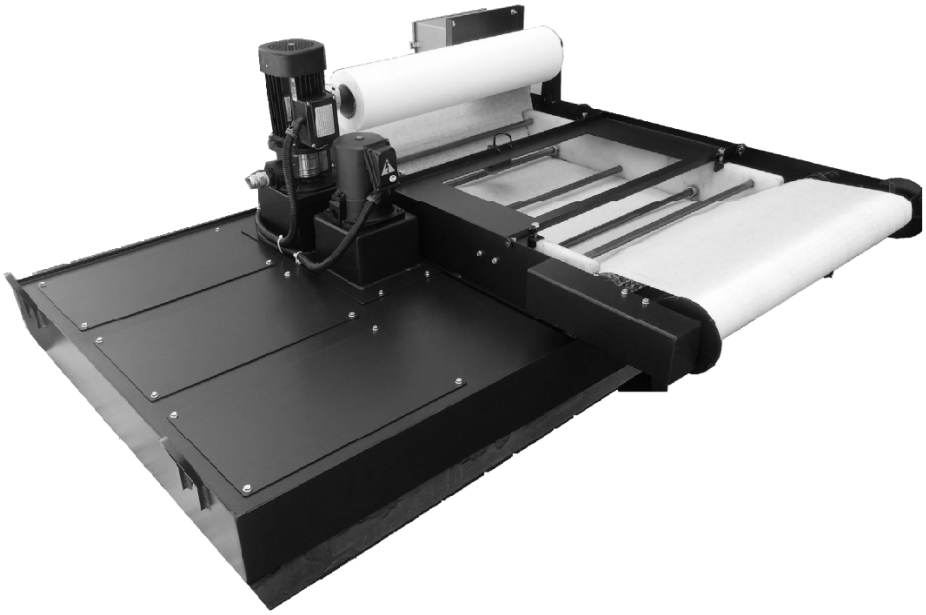
OPERATION
AND
MAINTENANCE MANUAL

MAYFRAN MODEL HPF-LP
HYDROSTATIC PRESSURE FILTER- LOW PROFILE



mayfran® INTERNATIONAL

Mayfran International, Incorporated
P.O. Box 43038
6650 Beta Drive
Cleveland, Ohio 44143
(440) 461-4100 tel.
(440) 461-5565 fax

CONVEYOR / SYSTEM INFORMATION

MACHINE INFO

Customer:			
Machine Type:			
Mfg. Year:		Serial No:	
Voltage/Phase		Cycle:	
Inspected by:			

WARRANTY PERIOD

Mayfran's Warranty is given on the following page.

Your Warranty period: Date shipped_____ through _____

CUSTOMER SERVICE / PARTS ORDERS

If you have any questions or need to order parts, please contact Mayfran International at:
(440) 461-4100 Fax: (440) 461-5565 8:00 a.m. to 5:00 p.m. (EST)

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WARRANTY STATEMENT

(a) Material and Workmanship. Mayfran International Inc. ("Mayfran") warrants that the equipment to be provided by it shall be of the design and construction described in its Proposal and shall be free of defects in workmanship or materials. Should any failure to conform to this warranty appear within the first 2000 hours of operation, but not later than one (1) year after shipment, Mayfran will, upon prompt notification thereof and substantiation that the equipment has been installed, maintained and operated in accordance with good industry practice and with any specific recommendations, correct such nonconformity, including nonconformity to the specifications in Mayfran's Proposal, by in-place repair or, at its option, by furnishing a replacement part F.O.B. shipping point. Labor and equipment necessary to effect in-place repairs or component replacement are to be provided by the Buyer. Mayfran will only provide instructions and supervision to support each in-place repair. The effects of misuse, abuse, neglect, lack of proper maintenance (e.g. lubrication), corrosion, operation at other than design condition, or normal wear are specifically excluded from Mayfran's warranty.

(b) Performance. The only performance warranties extended by Mayfran are contained on the pages entitled "Performance Warranties" in Mayfran's Proposal, if any. Any through-put rates contained on the Performance Warranties pages are based upon continuous operation of the equipment over the period specified without regard to whether such operation will meet Buyer's needs. Mayfran disclaims all liabilities and responsibility with respect to Buyer's needs.

Mayfran's total responsibility under this performance warranty shall be considered fulfilled and the equipment accepted if performance tests show that the equipment meets the conditions of performance specified by the Performance Warranties, if any, or if the equipment is not tested within 180 days of initial operation. In the event the equipment fails to meet the specified conditions of performance after properly conducted and evaluated tests, Mayfran reserves the right to make such alterations as may be necessary to meet the specified conditions free of charge to Buyer.

(c) General. Mayfran shall not be held responsible nor shall allowance be made for work done, equipment furnished, or repairs or replacements made by Buyer or by others unless prior written approval is given to Buyer by Mayfran.

With respect to accessory equipment and other vendor furnished apparatus included in its Proposal, Mayfran shall be responsible for the proper selection and specification requirements to the suppliers. Warranties for such items are limited to those extended to Mayfran by the manufacturers.

THE FOREGOING WARRANTIES ARE EXCLUSIVE AND IN LIEU OF ALL OTHER WARRANTIES, EXCEPT THAT OF TITLE, WHETHER WRITTEN, ORAL OR IMPLIED, IN FACT OR IN LAW (INCLUDING ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE). Correction of nonconformities whether patent or latent, in the manner and within the period of time provided above, shall constitute the fulfillment of all liabilities of Mayfran with respect to the equipment, whether based on contract, tort, strict liability or other legal theory.

In no event shall Mayfran or its contractors, subcontractors, vendors or suppliers, be liable in contract, tort, warranty, strict liability or other legal theory for any special, indirect, incidental or consequential damages such as, but not limited to, loss of anticipated profits or revenue, non-operation or increased expense of operation of other equipment, or costs of capital. The remedies of Buyer set forth herein are exclusive and the liability of Mayfran with respect to its contract or anything done in connection therewith whether in contract, tort, warranty, strict liability or other legal theory shall not exceed the purchase price of the equipment upon which liability is based. Buyer (if it will not be the ultimate owner or user of the equipment) shall obtain from the owner a written agreement that the owner will be bound by the remedies provided for herein. Buyer will also obtain from the owner a written release from consequential damages to the extent provided for herein in favor of Mayfran and its contractors, subcontractors, vendors and suppliers.

PART ORDERING INSTRUCTIONS

When ordering parts, please specify the following information:

1. **Serial number:** This is a seven-digit alpha numeric designation with the following form: (11D3000). The first two digits indicate the year of manufacture, and the remaining five is a Mayfran identification number for that particular conveyor. Note: This is also the Mayfran order, or job number.

2. **Part Number**: Specify the Mayfran part number as given in this manual or as found on the drawings for the particular conveyor.

3. **Quantity:** Specify how many are required.

4. **Name of Part:** Use the proper description or title, given in the owner's manual.

5. **Shipping Instructions:** Specify complete shipping instructions: Such as parcel post, truck, 2nd day air freight, or overnight air freight, along with the required ship date. When no instructions are given, shipping method will be best way, depending on nature of part and urgency of repair. Freight costs will be paid by customer.

6. **Return Address:** When ordering parts, always include your complete address with phone number. Keep in mind that parts cannot be delivered to a Post Office box.

7. **Returned Parts:** New parts returned to the factory will be subject to a restocking charge incurred, unless parts were sent by mistake from the factory. No part may be returned to the factory without prior written authorization from Mayfran (RGT #).

8. **Shortage:** If any parts are missing, other than parts marked back ordered, call the factory immediately.

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CLEVELAND, OHIO 44143

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SAFETY INFORMATION

THE SAFETY INFORMATION CONTAINED HEREIN MUST BE COMMUNICATED BY THE CUSTOMER, OWNER, OR END USER TO ALL PERSONNEL WHO WILL ACTUALLY OPERATE, MAINTAIN, REPAIR, OR ADJUST THIS MACHINERY, OR WHO ARE ASSIGNED TO WORK IN THE VICINITY OF THIS MACHINERY.

ADJUSTMENT, MAINTENANCE, CLEANING AND LUBRICATION SHOULD BE CARRIED OUT ONLY BY PERSONNEL TRAINED BY THE OWNER OR END USER IN THE OPERATION OF ALL ASSOCIATED CONVEYORS AND PROCESS EQUIPMENT. PERSONNEL SHOULD BE TRAINED IN OSHA COMPLIANT LOCK-OUT / TAG-OUT AND ELECTRICAL SAFETY PROCEDURES. RECORDS OF TRAINING SHOULD BE MAINTAINED BY THE OWNER OR END USER. RECORDS OF TRAINING FOR THE SAFE OPERATION OF THIS MACHINERY MUST ALSO BE MAINTAINED. NEVER SHOULD ADJUSTMENT, MAINTENANCE, CLEANING OR LUBRICATION BE PERFORMED WITHOUT FOLLOWING PROPER SAFETY PROCEDURES.

DO NOT operate any machinery without reading and understanding this manual completely.

DO NOT operate any machinery unless fully trained and qualified by the owner or end user.

DO NOT operate any machinery (or any portion of this machinery) unless all personnel are clear of any rotating or moving parts (or parts that may potentially move or rotate).

DO NOT operate any machinery unless all guards and/or emergency stops are in place and functioning as designed by Mayfran.

DO NOT perform any maintenance, repairs or adjustments on this machinery without first locking out all electrical controls.

DO NOT perform any maintenance on moving conveyor parts.

DO NOT lubricate any machinery without first locking out all electrical controls.

DO NOT clean this machinery or the areas adjacent to or below the machinery without first locking out all electrical controls.

DO NOT touch any moving conveyor parts.

DO NOT remove any covers or guards without locking out all electrical controls.

DO NOT perform any maintenance or repairs on power lines feeding this machinery without first locking out power at the source.

DO NOT remove or cover any warning labels.

DO NOT wear loose clothing or uncovered long hair that can get caught in moving parts.

DO NOT repair or replace electrical, hydraulic, or pneumatic devices without power or air off.

DO NOT remove jammed product with conveyor running. OSHA compliant lock-out / tag-out procedures must be followed prior to clearing a jam of any type.

DO NOT operate a conveyor equipped with rope pull safety switches if the rope pull switches are not functioning properly.

DO NOT cross over a conveyor, whether or not it is operating, other than on an elevated walkway that provides safe access and prevents contact with the conveyor.

DO NOT climb on the components of a conveyor.

DO NOT ride or walk on any conveyor.

DO NOT touch moving conveyor parts.

DO NOT walk under conveyor where product can fall.

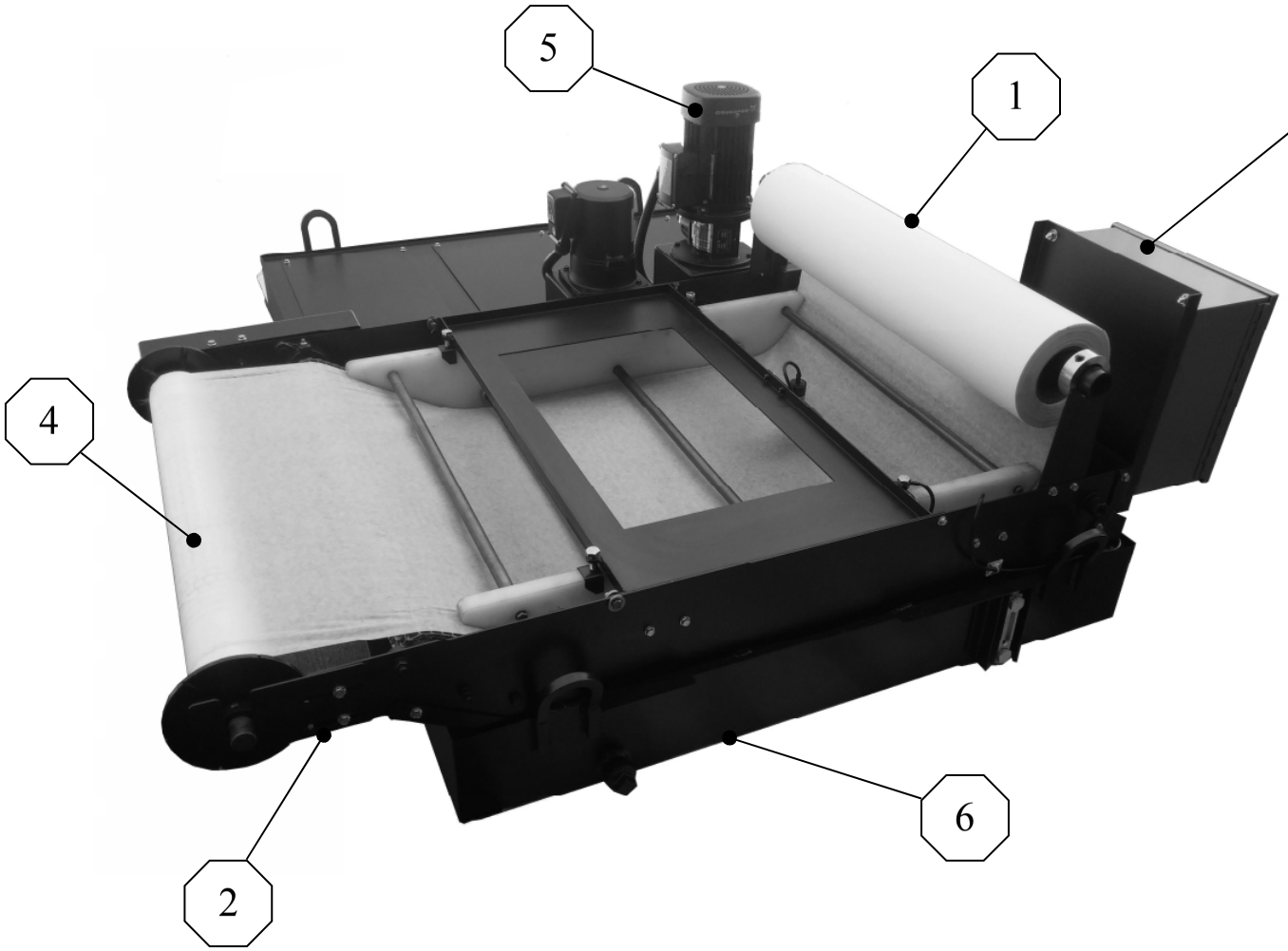
DO NOT operate conveyor without a visual or audible “all clear”.

SAFETY INFORMATION, CONTINUED

- If the entire conveyor cannot be seen from the operating station, an audible and/or visual warning shall be provided to warn of conveyor actuation.
- Conveyors should be used to transport only the material for which they were specifically designed.
- No conveyor shall be used in excess of its maximum rated speed and capacity.
- Casings, guards, safety switches, and other safety devices shall not be removed, bypassed, or disengaged during conveyor operation.
- Only trained operators shall be permitted to operate conveyors.
- All necessary guards, switches and other safety devices shall be installed so that a loss of power to the conveyor shall not render the guards, switches or safety devices inoperative.
- Each conveyor shall be kept free of accumulations of material that could inhibit its safe operation.
- Emergency controls shall be installed so that they cannot be overridden from other locations.
- Guards shall be kept in place at all times unless the electrical power is off and the conveyor is locked out
- All repairs and services shall be performed only by qualified personnel. Before repairs, tests or services are begun, all power controls shall be locked out in accordance with OSHA compliant procedures.
- Do not work near a conveyor without knowing where and how to shut it off.
- After a conveyor has been repaired, tested or serviced, it shall not be operated until all guards and safety devices have been reinstalled, all maintenance equipment has been removed and a visual inspection of the conveyor and immediate area has been completed.
- Material should not be discharged onto a conveyor that is not operating. Conversely, when stopping a conveyor or conveyor system, stop discharge of material onto initial receiving conveyor first, then continue stopping conveyors in succession after each has been cleared of its load.
- When working on the conveyor, be sure to turn the electrical disconnect OFF and LOCK OUT the power to the conveyor.
- Operators should be instructed to report any impairment of guards, emergency stop, or safety switches to their supervisors.

MAYFRAN INTERNATIONAL, INCORPORATED WILL NOT BE RESPONSIBLE FOR ANY WORK PERFORMED, OR ALTERATIONS MADE TO ANY OF ITS PRODUCTS UNLESS PRIOR APPROVAL HAS BEEN GRANTED IN WRITING BY AN AUTHORIZED MAYFRAN REPRESENTATIVE. ANY OTHER WORK WILL VOID ANY AND ALL WARRANTIES AND LIABILITIES. ALL WARRANTIES AND LIABILITIES SHALL ALSO BE VOID IF PARTS MANUFACTURED BY MAYFRAN INTERNATIONAL ARE REPLACED WITH PARTS OBTAINED FROM A SOURCE OTHER THAN MAYFRAN INTERNATIONAL.

General Arrangement: HPF-LP Hydrostatic Pressure Filter - Low Profile



General Arrangement BOM:

1 – HPF-LP Filter Assembly

2 – Gearmotor Drive Assembly (not shown)

3 – Electrical Control Assembly

4 – Filter Media

5 – System Pump [optional equipment]

6 – System Clean Tank

HFP-LP - MEDIA FILTER DRIVE ASSEMBLY [TYPICAL]

5IK40GN-SH / 5GN100SA, Induction Gear Motor

Motor Dimensions

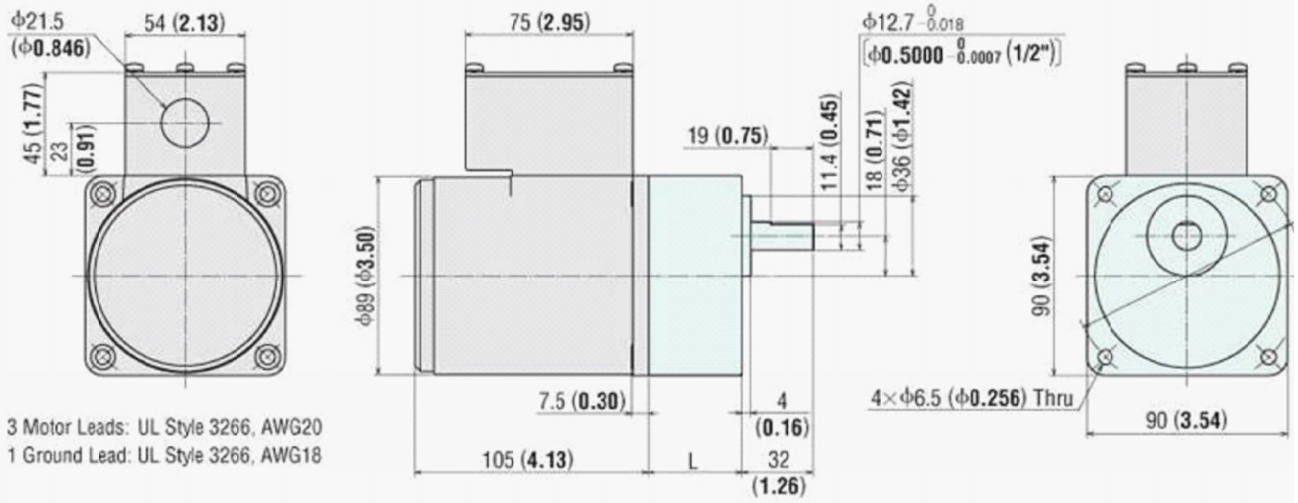
Dimensions Unit = mm (in.)

● Mounting screws are included with gearheads.

◇Conduit Box Type ③

Motor Model	Gearhead Model	Gear Ratio	L	DXF
5IK40GN-SH	5GN□SA	3~18	42 (1.65)	A903AU
		25~180	60 (2.36)	A903BU

Mass: Motor 2.5 kg (5.5 lb.)
Gearhead 1.5 kg (3.3 lb.)



3 Motor Leads: UL Style 3266, AWG20
1 Ground Lead: UL Style 3266, AWG18

NO.	REVISION DESCRIPTION	DATE	BY

	DATE	BY	SCALE
DRAWN			4:1
CHECKED			
APPROVED			DO NOT SCALE

GEAR MOTOR

mayfran INTERNATIONAL

ORDER NUMBER	CUSTOMER	DRAWING NUMBER	REVISION
		HPF-LP	0

TOLERANCE UNLESS OTHERWISE SPECIFIED : X.XX = ± 0.02 X.XXX = ± 0.005 FRACTIONS, STRUCTURAL ± 1/16, ANGLES ± 1/2°

HPF-LP – MEDIA CARRIER BELT ASSEMBY [TYPICAL]

Flat Wire Belting

TYPICAL PROCEDURE FOR ASSEMBLING FLAT WIRE BELTING

1. The flat wire belt assembly is constructed from high carbon steel and assembled to the exact length required for each HPF-LP model at Mayfran factory
   a. The flat wire belt assembly requires no field maintenance or take up adjustment
   b. Should the flat wire belt assembly require replacement in the future, contact Mayfran Parts Dept. to order a COMPLETE belt assembly

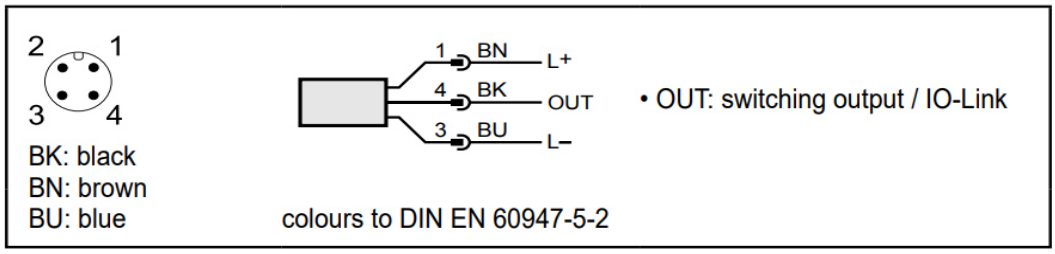
Flat Wire Belt Assembly [typical construction shown]

HPF-LP – EFEUGT592 SENSOR

4 Electrical connection

► Disconnect power.

► Connect unit (depending on the type selected):



The ultra-sonic proximity sensor comes pre-programmed with default setting to index the filter media for 10-seconds when the coolant surface comes within 15cm from the sensor's "eye". The sensor can be re-programmed with the following procedure:

5.2 Teach button

5.2.1 Start programming mode

► Press the teach button for 2 s...6 s.

> Yellow status LEDs flash (1 Hz), the unit is in the programming mode.

If programming has not been completed successfully, the unit returns to the previous setting.

5.2.2 Set output response

► Start programming mode (→ 5.2.1).

► Position the object in P1 (Fig. 1 or 2).

► Press the teach button for 1 s.

> Yellow status LEDs flash (2.5 Hz), P1 setting is completed.

► Position the object in P2 (Fig. 1 or 2).

► Press the teach button for 1 s.

> Yellow status LEDs flash briefly (4 Hz), P2 setting is completed.

5.2.3 Invert output response

► Press the teach button for > 6 s.

> Yellow status LEDs flash (> 10 Hz).

> Yellow status LEDs flash briefly (> 4 Hz).

> Output function is inverted.

5.2.4 Restore factory setting

► Align the unit so that no echo is received.

> Green echo LED off.

► Start programming mode (→ 5.2.1).

► Press the teach button for 1 s.

> Yellow status LEDs flash briefly (4 Hz), factory setting is restored.

****** The HPF-LP's flow rate capabilities are determined using the paper weight of clean filter media. Flow rate will decrease as the filter media cleanliness degrades. To reduce media consumption, we recommend optimizing your machining process to minimize coolant flow. ******

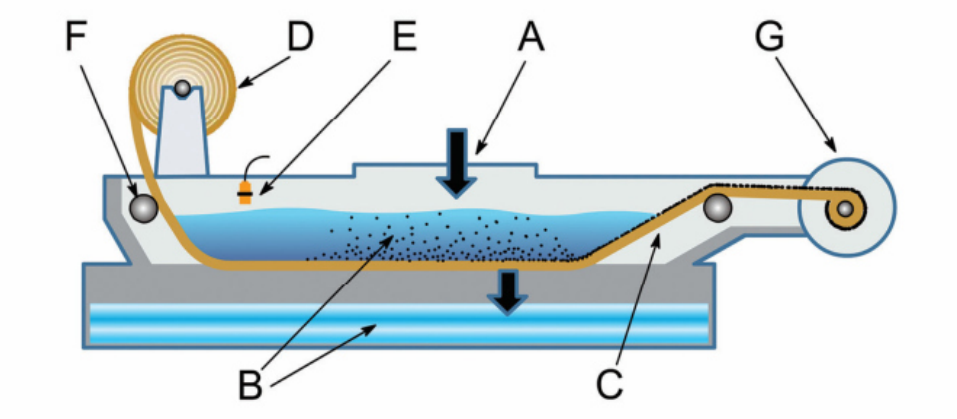
HPF-LP - Hydrostatic Pressure Filter - Low Profile OPERATIONS

HOW IT WORKS:

The HPF-LP [Hydrostatic Pressure Filter - Low Profile] is a high efficiency, deep bed gravity filter that utilizes filter media. It is a fully automatic unit, used for cleaning coolants in a variety of industrial applications.

The HPF-LP combines the highest level of chip removal with the most effective coolant filtration due in part to its unique side seal technology. This design prevents chips and particulate from entering the clean tank.

The HPF-LP has a significantly smaller overall footprint when compared to other flat bed filters, while achieving greater filtration levels per square foot of floor space.



A. Dirty coolant enters top of filter

B. Coolant filtered via gravity force through filter media into clean coolant tank

C. Filter media / carrier belt assembly

D. Filter cake forms on filter media

E. High level sensor activates drive assembly to advance filter media when filtering capacity decreases and coolant level rises

F. (OPTIONAL) Low and out of filter media warning sensors for filter media replacement or shutdown if empty

G. Spent media rewinder

MAINTENANCE

PREVENTIVE MAINTENANCE

- Periodically check the condition of the HPF-LP system and clean HPF-LP filter and/or tank as necessary. Removing excess material build-up or trapped material will prolong the life of the carrier belt, bearings, and reducer, and, when applicable, insure that electronic sensors will perform as they were designed. The frequency of machine cleaning depends on the type and amount of material being conveyed.

- Properly lubricate all components of the conveyor. This includes the bearings and reducer [see filling instructions, below], as applicable.

    - **GEAR REDUCER OIL FILLING INSTRUCTIONS:**
      The gear reducers for all HPF filter equipment are typically filled with oil at their factory. However, occasionally the unit may be shipped dry and will need to be filled at installation by the equipment installer. In either case, the reducer must first be checked to verify the presence and level of oil.

      CAUTION: Before running the drive, the reducer must be filled with the correct amount of appropriate oil or serious damage to the unit will result. Damage to the reducer due to operating without oil will void the manufacturers' warranty.

- Perform periodic inspection and testing of the equipment components. The following table lists recommended maintenance items and minimum intervals. It is recommended that the end user's maintenance manager produce their own preventive maintenance schedule based on these recommendations. It is recommended that the end user keep accurate records of all maintenance performed on this equipment.

ITEM	DESCRIPTION	INTERVAL
1	Check condition of all labels and safety decals. Replace if missing, damaged, or difficult to read.	Weekly
2	Check condition of HPF-LP equipment and remove debris as necessary	Monthly
3	Check condition of system tank and clean out as necessary	Every 3 months
4	Check reducer oil level	Every 6 months
5	Check belt and filter media operation	Every 6 months
6	Lubricate bearings	Every 6 months
7	Check limit switch / sensor operation	Every 3 months
8	Check belt tension of magnetic pre-separator (if applicable)	Every 3 months

TROUBLESHOOTING

SYMPTOM	PROBABLE CAUSE	POSSIBLE SOLUTION
Excessive jams without apparent blockage	Carrier belt jamming or damage	Check condition of flat wire belting and repair or replace ***** DO NOT REVERSE TO CLEAR JAM *****
Excessive jams without apparent blockage	Filter media jamming or damaged	Check condition of filter media at all transitional points and reposition or rerun new media through filter ***** DO NOT REVERSE TO CLEAR JAM *****
Excessive amperage draw	Excessive load or material jammed in carrier belt or filter media path	Remove excess material – check carrier belt path for jammed material and remove Reposition or rerun filter media through filter ***** DO NOT REVERSE TO CLEAR JAM *****
HPF-LP filter operation stops	Undersized circuit breaker overload	Install properly sized circuit breaker overload based on FLA of motor
	Defective gearmotor	Replace gearmotor

CHECKOUT SHEET FOR HPF-LP MEDIA FILTER EQUIPMENT

SITE / PLANT _____ MOTOR HP _____

LOCATION _____ MOTOR VOLTAGE / F.L.A. RATING _____

EQUIPMENT SERIAL NO. _____

	ITEM	BY	DATE	NOTES
	ELECTRICAL CHECKOUT COMPLETE			
	DEBRIS, IF ANY, REMOVED FROM BETWEEN BELT STRANDS			
	ALL FASTENERS INSTALLED & TIGHTENED			
	ALL SLOTTED ADJUSTMENT HOLES HAVE FLAT WASHERS NEXT TO SLOT			
	ALL ANCHORS INSTALLED & TIGHT			
	ELECTRICAL POWER TO MOTOR			
	MOTOR ROTATION CORRECT			
	REDUCER OIL LEVEL CORRECT, REDUCER VENTED			
	FILTER MEDIA PROPERLY MOUNTED ON EQUIPMENT			
	FILTER MEDIA PROPERLY INSTALLED IN EQUIPMENT			
	FILTER MEDIA SENSORS PROPERLY MOUNTED & INSTALLED			
	ALL SENSORS PROPERLY MOUNTED & INSTALLED			
	ALL GUARDS INSTALLED			
	AMPERAGE DRAW & VOLTAGE COMPARED TO RATINGS ON MOTOR NAMEPLATE			READINGS: _____/_____
	ALL SAFETY AND WARNING LABELS ARE PRESENT			

STANDARD OPTIONS

1. Magnetic Pre-Separator
2. Sensors
3. System Pump

OPERATION OF OPTIONAL MAGNETIC PRE-SEPARATOR CONVEYOR

The magnetic pre-separator conveyor is a drag conveyor that utilizes a magnetic field to trap ferrous material before reaching the HPF-LP filter bed. The conveyor then discharges the material into a provided waste cart. With the magnetic pre-separator conveyor in place the filter media consumption is reduced by as much as 80%.

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