LAKOS®
FILTRATION SOLUTIONS

INSTALLATION OPERATIONS AND MAINTENANCE

DUAL SCREEN STANDARD DUTY SELF-CLEANING ELECTRIC SCREEN FILTER I&O MANUAL

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LS-1050A (6-21)

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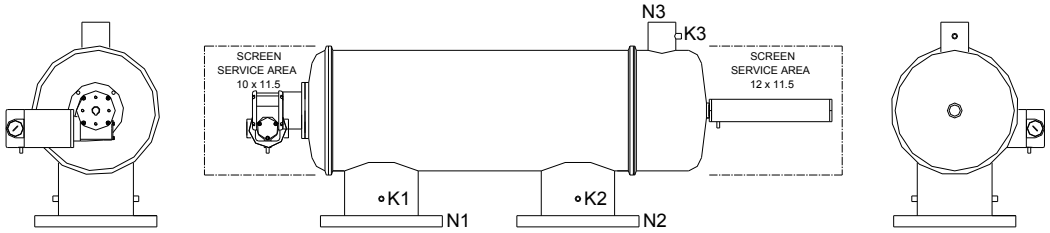
Filter Basics

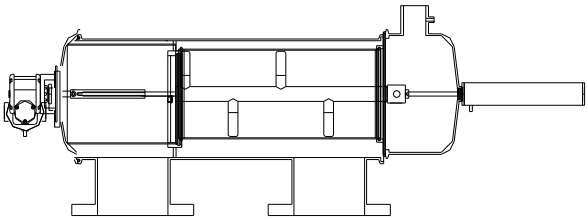
The Dual Screen SD/H series is a low pressure self-cleaning screen water filter. The major components include the Filter Housing (1), Coarse Screen pre-filter (11), Fine Screen filter element (2), Particle Remover (3), Hydraulic Piston (8), Backwash Valve (12), and Electric Motor (13.1).

Dual Screen SD/H Series Filter – General Layout

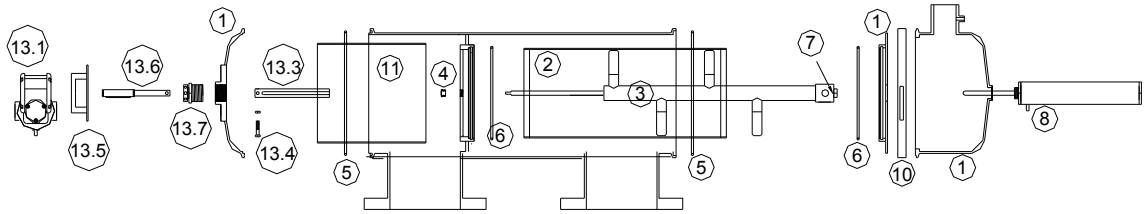


N1	INLET
N2	OUTLET
N3	FLUSH OUTLET
K1	HYD CONNECTION
K2	HYD CONNECTION
K3	HYD CONNECTION

Dual Screen SD/H Series Filter – Assembly View



Dual Screen SD/H Series Filter – Exploded View

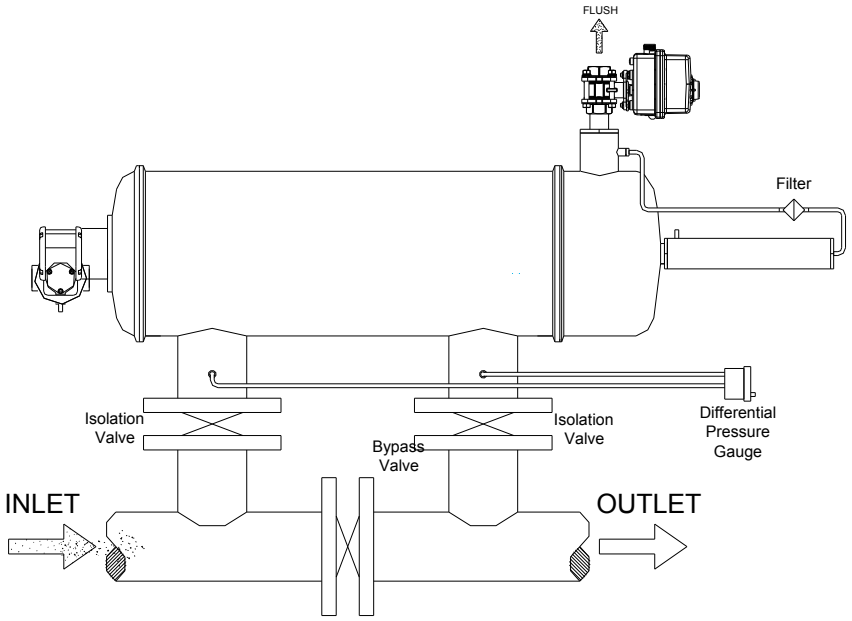


1. FILTER HOUSING
2. FINE SCREEN
3. PARTICLE REMOVER
4. BUSHING
5. HOUSING SEAL
6. SCREEN O-RING
7. SPACER
8. HYDRAULIC PISTON
11. COARSE SCREEN
13.1 DC Motor
13.2 Leading Bolt
13.3 Particle Remover Adaptor
13.4 Adaptor Bolt
13.5 Mounting Bracket
13.6 Motor Drive Shaft
13.7 Compression Packing Housing

Installation Requirements

Dual Screen SD/H Series filters may be mounted directly on the inlet (N1) and outlet (N2) flanges, and positioned in any orientation. Isolation valves should be installed at the inlet and outlet, and a bypass valve should be installed between the flanges. This will allow the filter to be taken offline without disruption to water flow.

Dual Screen SD/H Series Filter – Installation Layout



There should be adequate clearance around the filter to allow for easy maintenance access, including a minimum of 24” from the back (piston side). The minimum clearance on the front (cover) depends on the model. There must be enough room to remove the coarse screen and fine screen periodically.

FLUSH LINE

The piping for the flush valve must have no backpressure. It is strongly recommended to use oversized piping to accommodate this requirement. For a 1” valve, 1.5” or 2” pipe must be used.

To minimize backpressure on the flush line, it is also important to avoid elevation gain in the flush line. Even a small elevation gain can reduce the filter’s ability to perform an effective backwash cycle. If flush water must be transported to higher elevation, it is recommended to pipe the flush line to a storage tank first, and then pump out to higher elevation.

HYDRAULIC CONNECTIONS

Each flanged connection nozzle (N1 & N2) on the Dual Screen SD/H Series Filter has two ¼" threaded couplings. One may be used to install a pressure gauge or other sensor equipment. The other ¼" coupling will be used to connect hydraulic tubing from the differential pressure switch to the filter. The high pressure line is fitted to the inlet, and low pressure fitted to the outlet.

HYDRAULIC PISTON

The piston (8) is mounted on the domed end of the filter. ¼" tubing must be installed from the fitting located on the back of the piston to the hydraulic connection (K3) on the flush outlet (N3). A filter is installed on the hydraulic tubing to protect the piston.

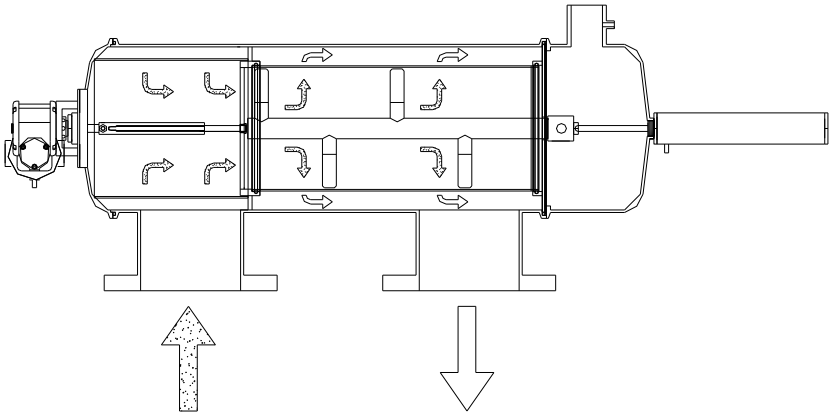
Filter Performance

NORMAL OPERATION

During normal operation of the filter, dirty water enters through the inlet and passes through the coarse screen. Any abnormally large debris is caught here and prevented from possibly damaging the fine screen or particle remover.

Water then travels down the center of the filter and is strained across the fine screen. As water passes from inside the screen to outside, suspended particles are trapped on the fine screen and continue to buildup, eventually creating a drop in pressure at the outlet of the filter.

Dual Screen SD/H Series Filter – Normal Operation

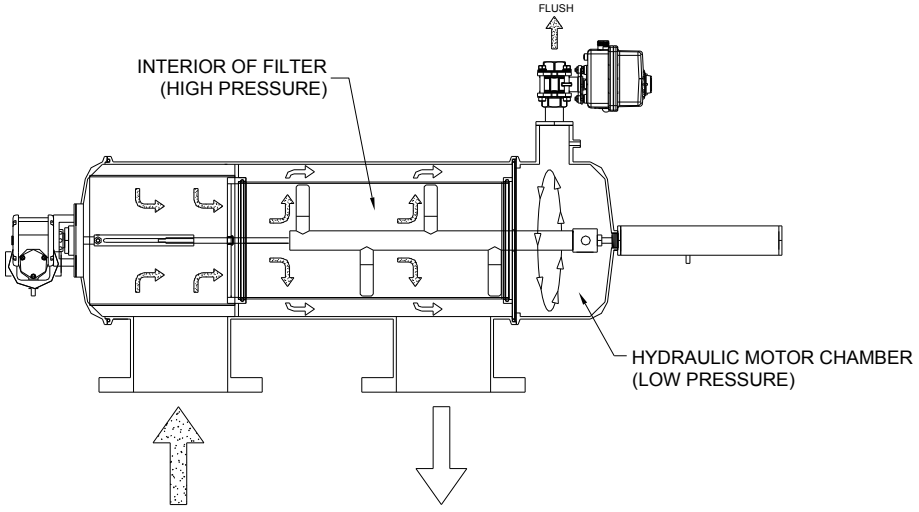


This drop in outlet pressure is monitored by the differential pressure gauge, which at seven PSID (pounds per square inch differential) sends a signal to the controller to initiate a backwash cycle.

BACKWASH CYCLE

The controller opens the flush valve, which causes a drop in pressure in the hydraulic motor chamber. This creates a low pressure path inside the particle remover, which acts as a vacuum at the end of the suction nozzles, removing the built up debris from the inside of the fine screen.

Dual Screen SD/H Series Filter – Backwash Cycle



Water flows through the suction nozzles, down the interior of the particle remover, and out the hydraulic motor. The motor rotates the particle remover, enabling each suction nozzle to cover a radial strip of screen. The pressure difference between the interior of the filter and the hydraulic motor chamber drives the particle remover toward the hydraulic piston.

The piston depressurizes during the backwash cycle, and expels the volume of water from its chamber. This acts as a timer, gradually allowing the particle remover to drive the piston rod into the piston, assuring that the suction nozzles cover the entire surface of the fine screen. When the piston reaches the end of its stroke, the backwash cycle is complete, and the flush valve closes. Pressure inside the hydraulic motor chamber normalizes, and the piston pushes the particle remover back to its original position.

After the piston and particle remover move back to their original positions, the filter returns to normal operation. During the entire backwash cycle, the main flow through the filter is never disrupted.

Flow & Pressure Requirements

Dual Screen SD/H Series Filter have a minimum pressure requirement of 20 PSI. This includes any pressure loss incurred during the backwash cycle. Therefore the pump performance is a crucial component in determining whether the filter will perform correctly.

Pump manufacturers will provide the performance data in the form of a pump curve. This is a graph that plots pressure vs. flow rate. A pump is considered adequate for an application if it can maintain a minimum of 20 PSI while pumping the normal system flow AND the additional flow required during backwash. The additional flow depends on the filter model and what valve is used.

Dual Screen SD/H Series Filter – Flow Rates

Valve	Flow Rate
1"	40 gpm
1.5"	100 gpm
2"	220 gpm

Maintenance & Spare Parts

STARTUP

When pumping water through the Dual Screen SD/H Series Filter series for the first time or after it has been emptied, it is important to follow a correct sequence of valve actuation in order to prevent damage to the filter components.

With both isolation valves closed and the bypass valve open, the correct sequence is:

1. Slowly open the inlet isolation valve letting water flow into the filter. If installed, bleed the air through a valve on the top of the filter body. Let the entire filter fill with water before moving to the next step.
2. Close the bypass valve.
3. Open the outlet isolation valve.

If it is not possible to close the bypass valve momentarily before opening the outlet valve, then both may be actuated simultaneously.

SHUTDOWN

To remove the filter from operation, reverse the steps used for startup.

1. Close the outlet valve.
2. Open the bypass valve
3. Close the inlet valve, and slowly open the drain valve on the bottom of the filter housing. There will be residual pressure in the tank still, so use caution when draining.

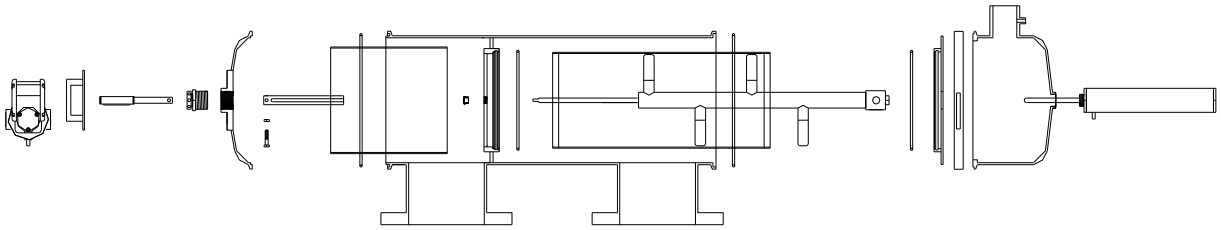
If it is not possible to close the outlet valve momentarily before opening the bypass, then both may be actuated simultaneously.

PERIODIC MAINTENANCE

Every six months to a year, or during scheduled down-time it is recommended to open the filter and inspect the components. Access to the internal components is through the front cover and hydraulic motor chamber.

Remove the piston from the back filter and drain the water from the hydraulic motor chamber. Verify that the piston rod is moving smoothly in and out, and inspect the piston tip for wear.

Dual Screen SD/H Series Filter – Inspection



Remove the hydraulic motor from the rest of the particle remover by accessing it through the piston-side cover.

Remove the screen and particle remover, using the piston-side cover for access. Separate the two items and inspect them carefully. The screen mesh and bushing should be inspected for wear, as well as the particle remover rod and suction nozzles.

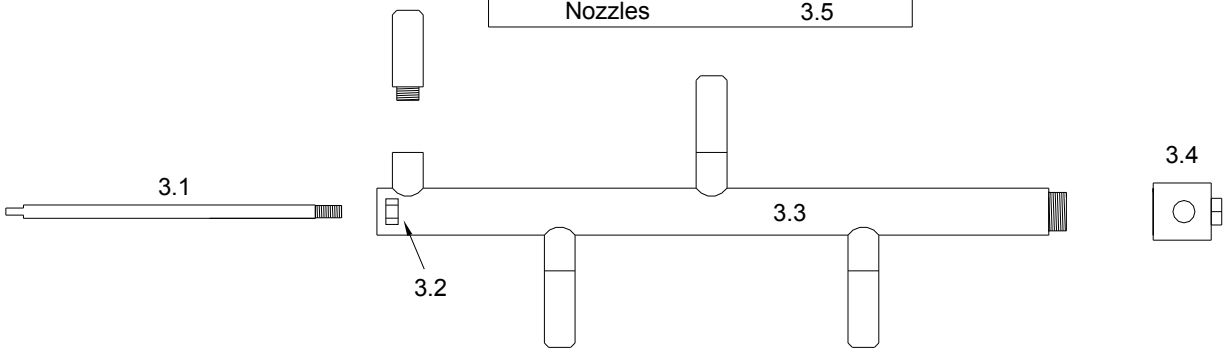
SPARE PARTS

Spare parts for maintenance for two years include:

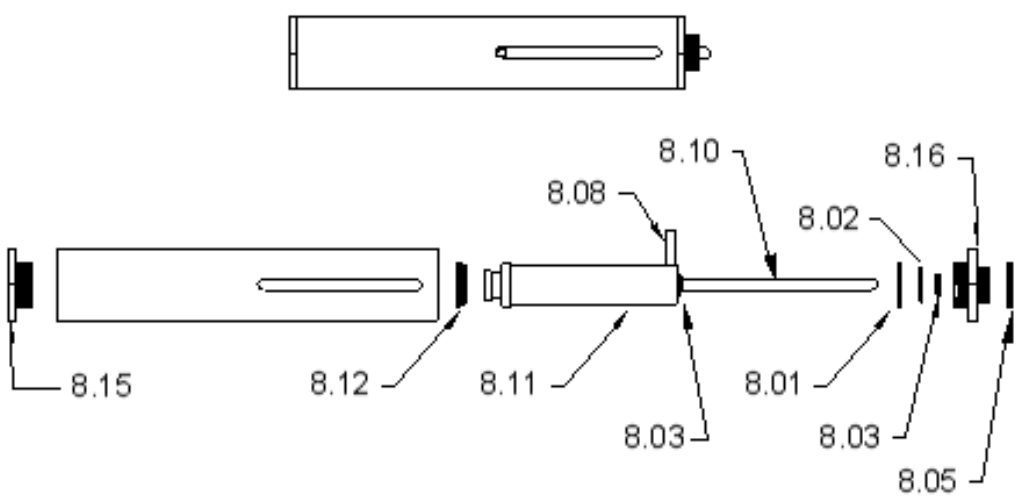
Screen O-rings (6)
Cover Seal (5)
Suction Nozzles (3.5)
Bushing (4)
Differential Pressure Gauge (18)
Piston Shaft Tip (8.9)
Piston Seal Kit (8K)
Mini-Filter (16)
Valve (p/n 12)
Fine Screen (2)
Particle Remover (3)
Spacer (7)
Leading Bolt (13.2)
Motor Drive Shaft (13.6)
Compression Packing Housing (13.7)
Compression Packing (13.8)
DC Motor Drive (13.9)

Dual Screen SD/H Series Filter – Particle Remover Partrs List

ITEM	PART NUMBER
Particle Remover	3
Rod	3.1
Counter-Nut	3.2
Casing	3.3
Rotating Sprinkler	3.4
Nozzles	3.5



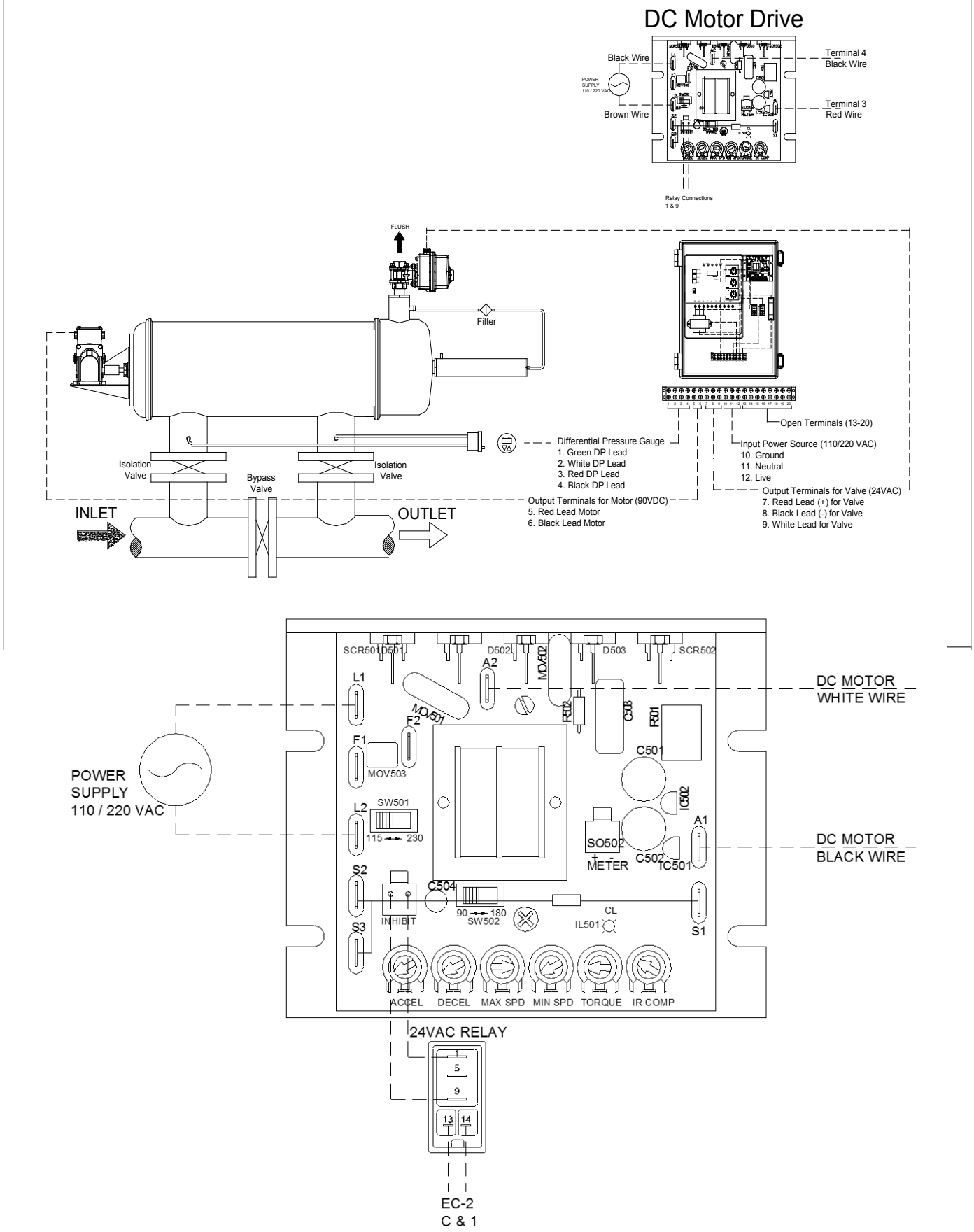
Dual SD/H Series Piston - Parts List

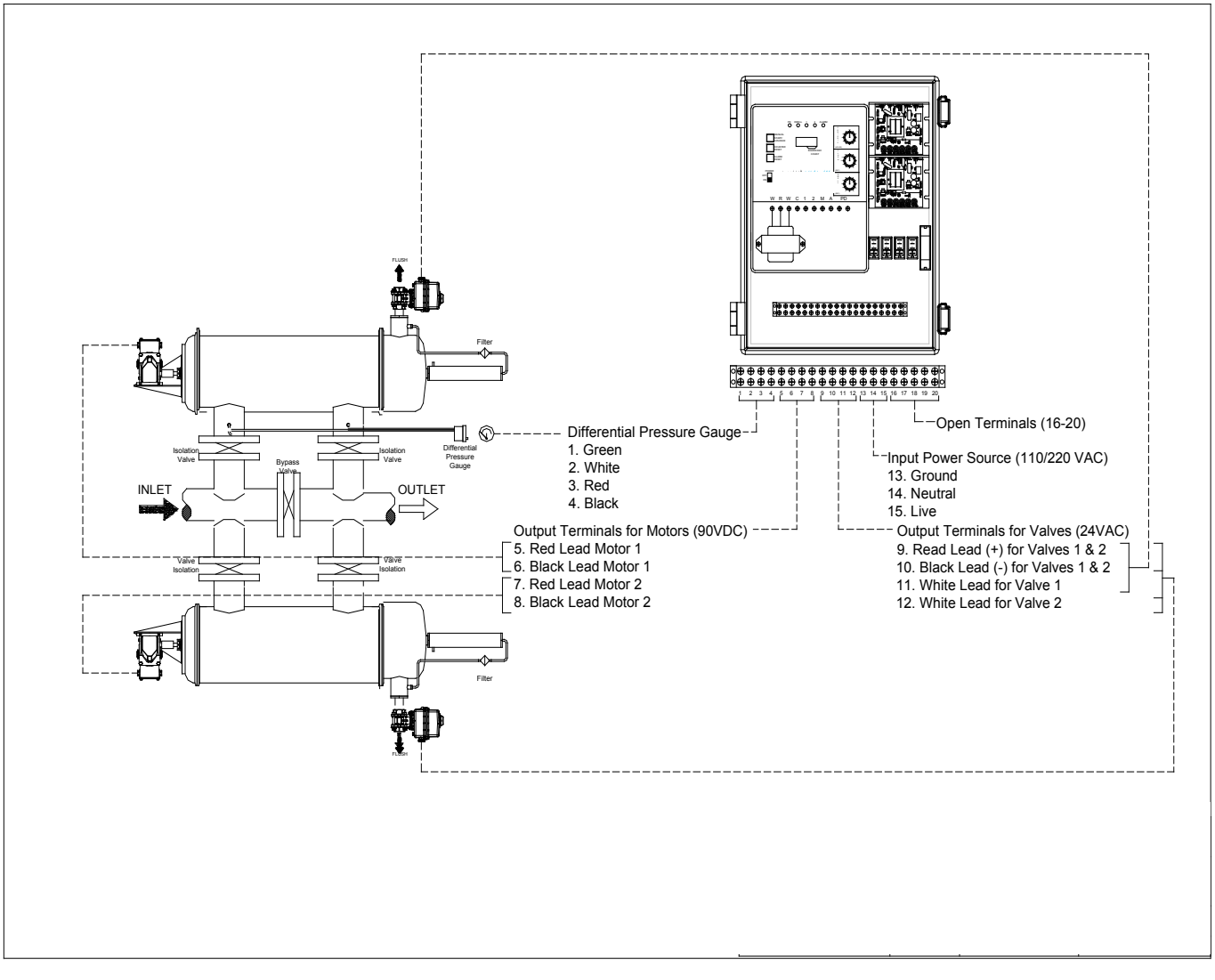


ITEM	PART NUMBER
Hydraulic Piston	8
Snap Ring	8.01
Head Ring	8.02
Shaft U-cup	8.03
Head O-ring	8.05
Shaft O-ring	8.06
Piston Pin	8.08
Shaft	8.10
U-cup Holder	8.11
Casing U-cup	8.12
Casing	8.14
Casing Cap	8.15
Piston Head	8.16

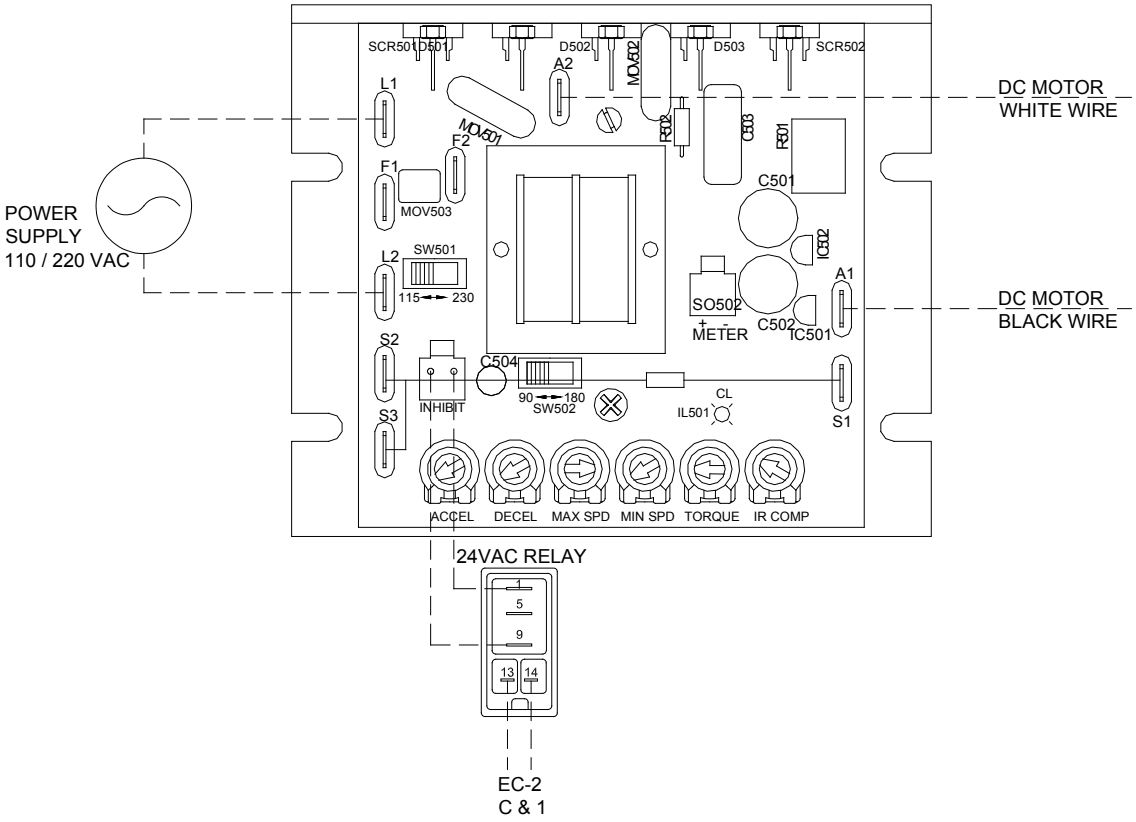
Wiring Diagram – Electric Screen Filter

SD/H DC Motor Drive

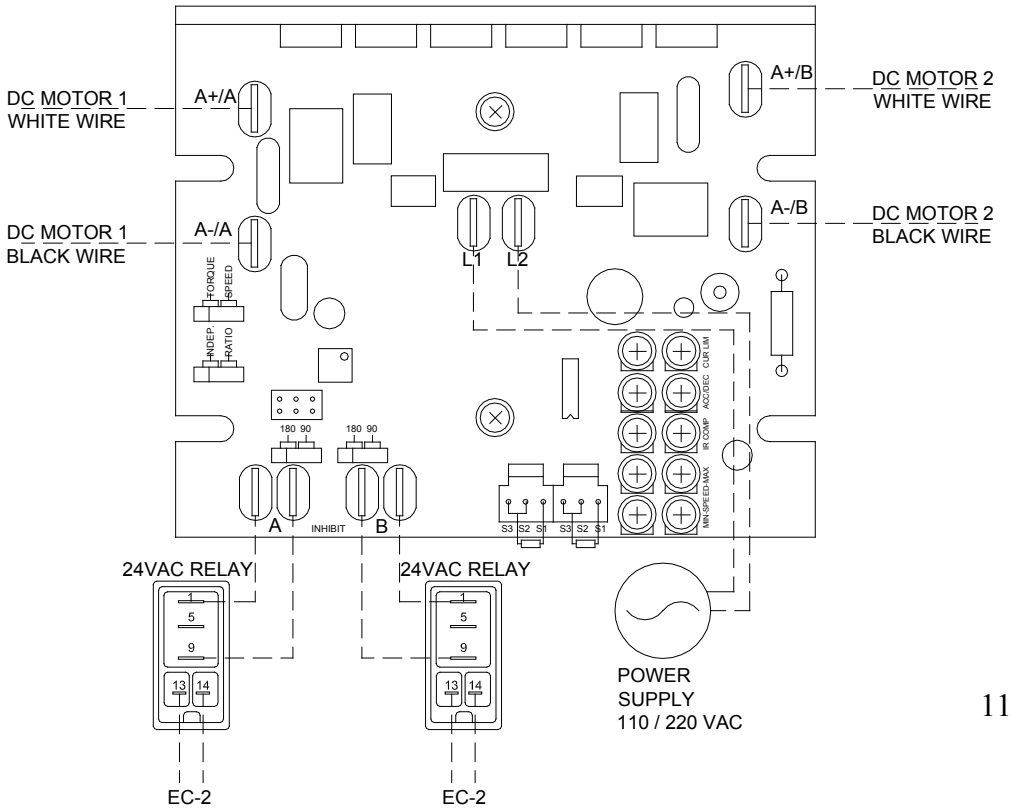



FLUSH
Filter
Isolation Valve
Bypass Valve
Isolation Valve
Differential Pressure Gauge
INLET
OUTLET
Valve Isolation
Valve Isolation
Filter
FLUSH
Differential Pressure Gauge
1. Green
2. White
3. Red
4. Black
Output Terminals for Motors (90VDC)
5. Red Lead Motor 1
6. Black Lead Motor 1
7. Red Lead Motor 2
8. Black Lead Motor 2
Open Terminals (16-20)
Input Power Source (110/220 VAC)
13. Ground
14. Neutral
15. Live
Output Terminals for Valves (24VAC)
9. Read Lead (+) for Valves 1 & 2
10. Black Lead (-) for Valves 1 & 2
11. White Lead for Valve 1
12. White Lead for Valve 2

SD/H Single Screen – DC Drive Wiring



SD/H Two-Screen Parallel – DC Drive Wiring



WARRANTY

LAKOS guarantees all self-cleaning water filters, components, and accessories free of defects for one year from sale.

If a fault develops, notify us, giving a complete description with images of the alleged malfunction. Include the model number(s), tank serial number, date of delivery and operating conditions of subject product(s). LAKOS will subsequently review this information and, at our option, supply you with either servicing data or shipping instruction and returned materials authorization. Upon prepaid receipt of subject product(s) at the instructed destination, we will then either repair or replace such product(s), at our option, and if determined to be a warranted defect, we will perform such necessary product repairs or replace such product(s) at our expense.
This limited warranty does not cover any products, damages or injuries resulting from misuse, neglect, normal expected wear, chemically-caused corrosion, improper installation or operation contrary to factory recommendation. Nor does it cover equipment that has been modified, tampered with or altered without authorization.
No other extended liabilities are stated or implied and this warranty in no event covers incidental or consequential damages, injuries or costs resulting from any such defective product(s).

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IT IS EXPRESSLY AGREED THAT LAKOS AND DISTRIBUTOR ASSUME NO LIABILITY FOR INDIRECT, INCIDENTAL, PUNITIVE, CONSEQUENTIAL, OR OTHER DAMAGES OF ANY KIND OR DESCRIPTION (INCLUDING, WITHOUT LIMITATION, CROP REDUCTION OR LOSS, LOST PROFITS, LOST REVENUES, EXPENSES, AND/OR FAILURE TO REALIZE SAVINGS, EVEN IF INFORMED OF THE POSSIBILITY OF

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THE LIABILITY OF LAKOS AND DISTRIBUTOR ARISING OUT OF SUPPLYING SAID EQUIPMENT, OR ITS USE, WHETHER ON WARRANTIES OR OTHERWISE, SHALL NOT IN ANY CASE BE GREATER IN AMOUNT THAN THE NET PURCHASE PRICE OF THE EQUIPMENT.

YOUR RESPONSIBILITY

The above warranties are subject to the following additional conditions:

1. The LAKOS products and components must be maintained and operated within the guidelines outlined in the Operation and Maintenance Manual

2. Purchaser must notify LAKOS in writing of any claim immediately and in no event less than thirty (30) days after the failure of the LAKOS product or component (i) is discovered or (ii) reasonably should have been discovered. Such notice shall include a complete description of the alleged failure, model number(s), date(s) of delivery, and operating condition of the LAKOS product(s).

3. To obtain any needed repair(s) or replacement of any LAKOS products and/or components, a Return Material Authorization (RMA) must be completed by Purchaser and returned with the defective items in order to ensure proper

4. Upon request by LAKOS, Purchaser must return all LAKOS products and/or components that have been determined by LAKOS to be covered by a limited warranty of LAKOS or the applicable LAKOS distributor not later than thirty (30) days after such determination, with Purchaser being responsible for freight.

5. The alleged defect or failure must be discovered within the respective warranty period set forth above with respect to the applicable LAKOS product and/or component.