

# Tower System Sand Filters

With Stainless Steel Construction

# STS

Exceeds industry specifications for keeping cooling water systems free of troublesome contaminants. Removes particles and floating debris. Controls build-up in tower basins and remote sumps. Helps maintain optimum operating conditions for reduced maintenance, servicing, downtime, energy costs, water loss and chemical usage.

LAKOS Tower System Sand Filters are designed exclusively for the demands of cooling tower operations, achieving to 5 micron performance. Either for side-stream or full-stream applications, Tower System Sand Filters offer a full range of systems to meet your specific needs.

### High efficiency, performance to 5 microns

Uniform, high porosity media for consistent, reliable performance at a low pressure loss.

### Stainless steel tanks

Durable, long-lasting and affordable.

### Backwash options

Durable, electrically-actuated, mechanically-linked butterfly valves. Piping configurations for backwashing with system water or municipal/other water source.

### Effective underdrain design

Encourages uniform flow through the sand media. Industry-low pressure loss. Field-serviceable. Provides high capacity backwashing for thorough media cleaning cycles. Prevents residual build-up and excessive backwash frequency. Choice of source water or public water for backwashing.

### Complete, packaged system

Includes filter, automatic controls, valves, pump, pump strainer and piping on a rigid skid. Media also provided. Easy installation and start-up.

### Compact, low-profile design

Minimum space requirements, easy handling and installation.



Flow range:  
18 - 1,010 U.S. gpm  
(4 - 230 m<sup>3</sup>/hr)

*For higher flow rates, consult factory.*



*Exclusive multi-tank modular design for larger flow rates. See inside pages for greater details.*

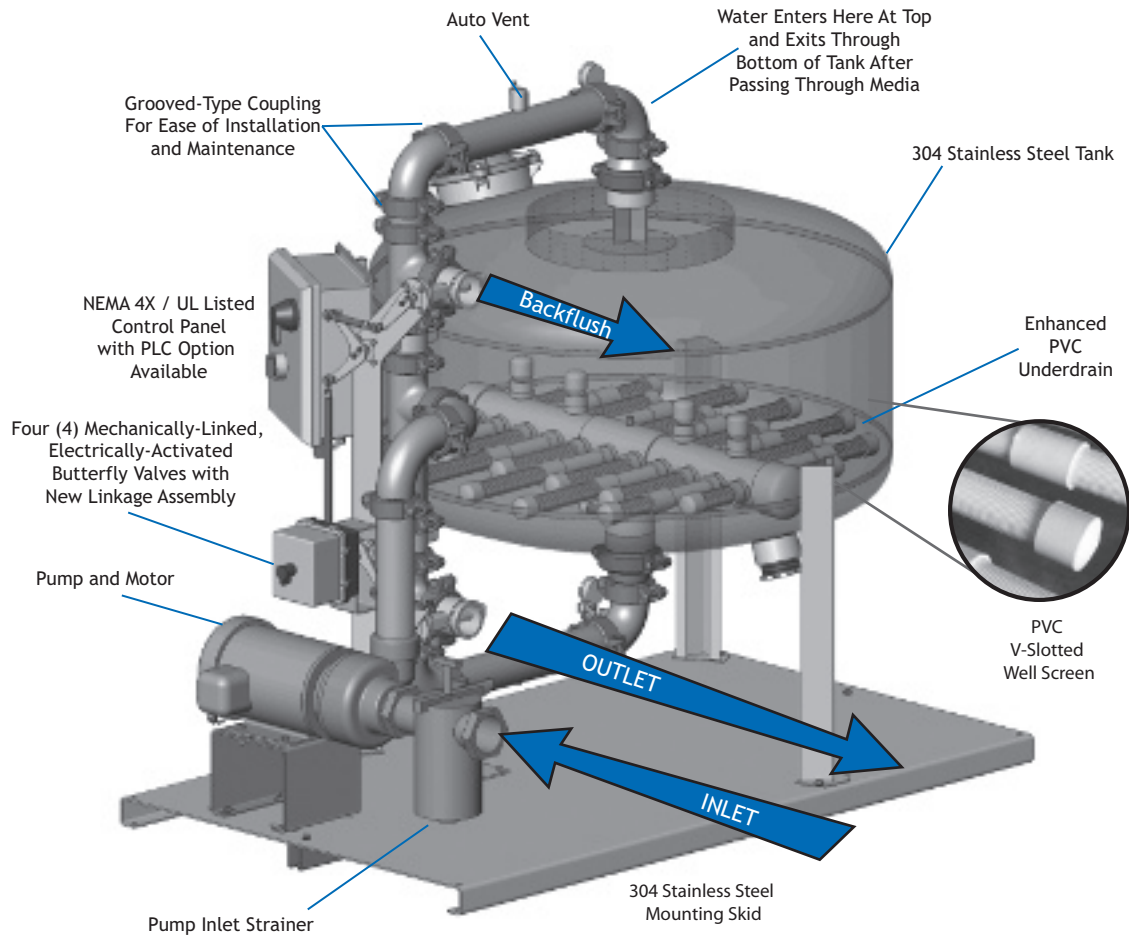
## How It Works

### Controls and Operation

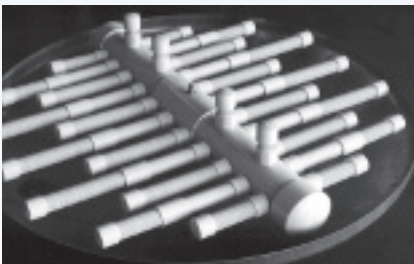
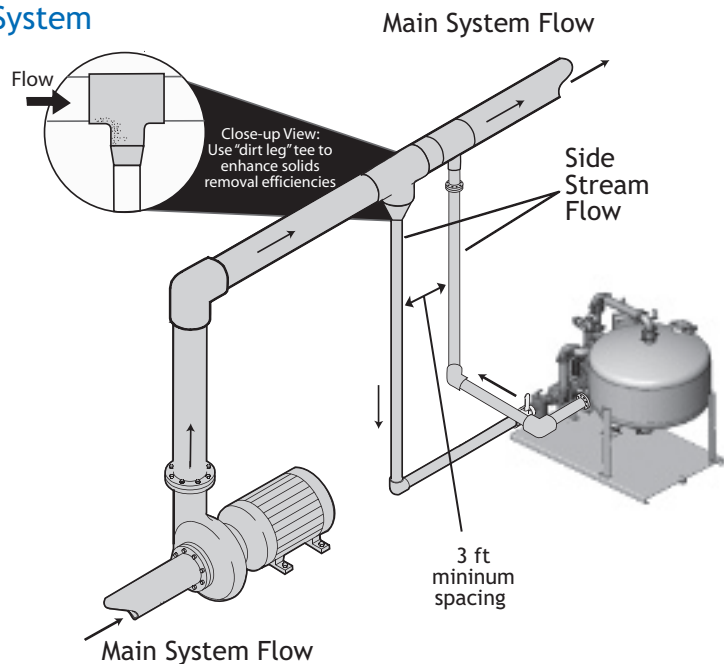
#### Filter Operation

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 tank through the underdrain assembly at the bottom of the filter and returns to the piping system.

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



#### Side-Stream Operation with STS System



Exclusive LAKOS underdrain optimizes filtration/backwashing efficiency.

## General Specifications

Model	Flow Range* U.S. gpm	Filtration Surface Area		Inlet/Outlet Inches		Pump HP	Sand Requirement		Operating Weight		Shipping Weight**		Full Load Amps
		ft. <sup>2</sup>	m <sup>2</sup>	FPT	grooved		lbs.	kg	lbs.	kg	lbs.	kg	
STS-15-025	18-25	1.2	0.1	1-1/2	2	1/2	150	68	482	219	580	263	1.1
STS-18-045	24-45	1.8	0.2	1-1/2	2	1	250	113	649	294	915	415	2.1
STS-24-075	40-75	3.1	0.3	1-1/2	2	1-1/2	450	204	1062	482	1297	588	3
STS-30-110	73-110	4.9	0.5	2	2	2	500	227	1425	646	1575	714	3.4
STS-36-165	106-165	7.1	0.7	3	3	3	900	408	2220	1007	2010	912	4.8
STS-48-310	160-310	12.6	1.2	3	3	5	1300	590	3624	1644	2498	1133	7.6
STS-248-600	300-600	25.2	2.3	6	6	10	2600	1180	5865	2600	5275	2393	14.0
STS-348-800	564-800	37.8	3.5	8	6	15	3900	1770	8485	3849	7450	3379	21.0
STS-448-1010	752-1010	50.4	4.7	8	8	20	5200	2360	11,220	5090	9820	4455	27.0

\* Flow range is based on the guideline of 15-25 US gpm/ft.<sup>2</sup> Models also available at higher flow rates.

\*\* Includes media sand

Multi-tank systems available only with automatic backwash control, using system water supply.

All single-tank systems may be specified either automatic or manual backwash control and choice of system water or city water for backwash supply.

Standard power requirement of 460 volt, 3 phase; specify other voltage is required.

Filtration media is 10 micron standard; 5 micron optional; consult factory for other options.

All STS system pumps are rated for 50 feet TDH.

## STS Multi-Tank Logic

Only LAKOS maintains the integrity of its sand filter design for higher flow rate requirements. Instead of making larger tanks, LAKOS combines two or more of its 48-inch diameter tanks (see General Specifications at right) and applies its proven underdrain for maximum system integrity.

- Space saving modular design allows multiple tanks to compare similarly to larger-tank footprints for floor space. Also, multiple tanks can be configured for in-line installation when needed to accommodate space restrictions.

- Lower profile is maintained with smaller tanks. Better for servicing. Fits tighter spaces and ceiling restrictions.

- Easier to install. Each tank and the pump module can be moved separately for easy passage through small doorways and lighter lifting loads.

- Backwash flow is limited to one tank at a time, eliminating high-volume backwashing. May also eliminate the need for a backwash reservoir prior to waste discharge.

- Continuous operation capability. Even during backwashing, a majority of system flow continues through the filters to system use. No system downtime.

## Dimensions

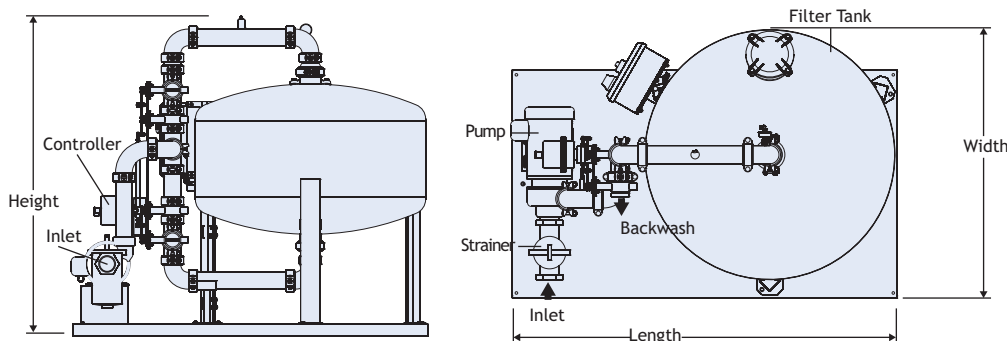
(for Single Tank Systems)

Model	Length		Width		Height	
	in.	mm	in.	mm	in.	mm
STS-15-025	52	1321	33	838	51	1295
STS-18-045	52	1321	33	838	55	1397
STS-24-075	59	1499	36	914	55	1397
STS-30-110	59	1499	36	914	55	1397
STS-36-165	63	1600	43	1092	65	1651
STS-48-310	74	1880	52	1321	67	1702

All drawings shown indicate "system water backwash" configurations. Consult factory for "city water backwash" option. Dimensions above apply to both systems.

\*These tanks can be configured for Basin Sweeping. Refer to page 5.

### For STS-15 Thru STS-48 Systems Only



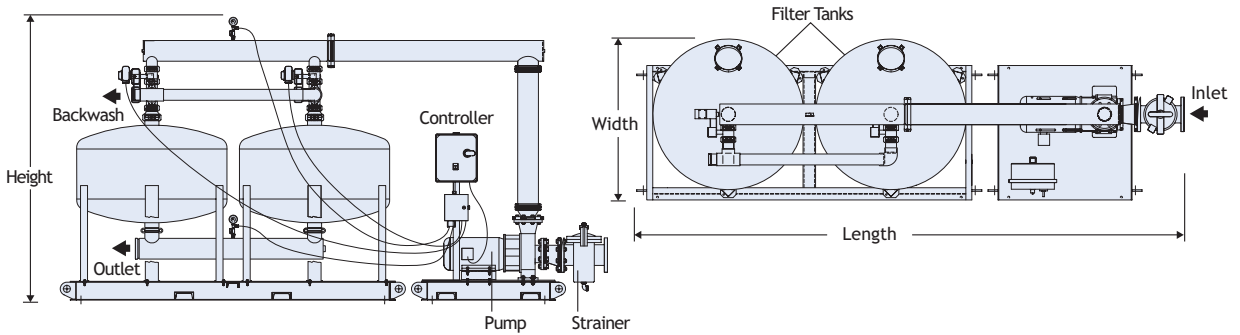
# Dimensions

(for Multi-Tank Systems)

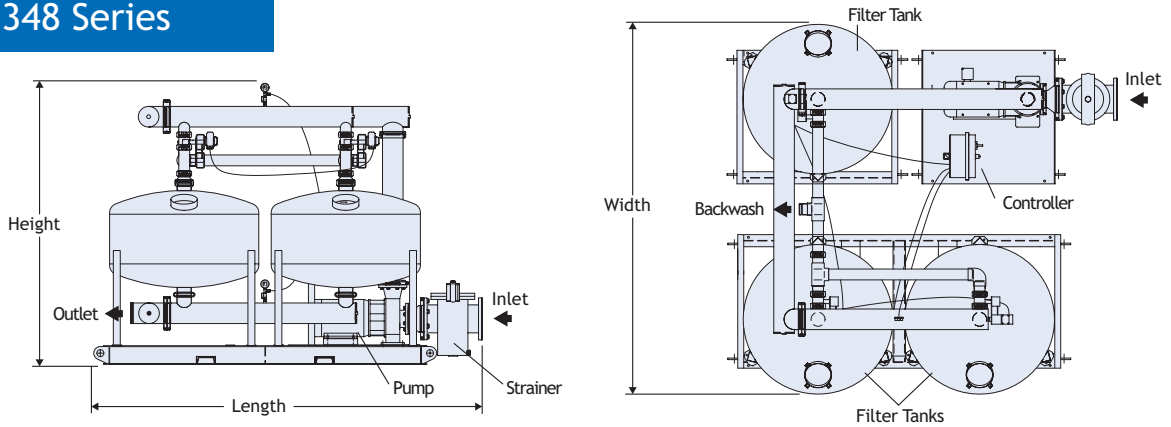
Model	Length		Width		Height	
	in.	mm	in.	mm	in.	mm
STS-248-600*	175	4445	52	1321	91	2311
STS-348-800*	122	3099	122	3099	91	2311
STS-448-1010*	181	4597	122	3099	91	2311

NOTE: Multi-tank systems (STS-248-600 and larger) may be configured differently to accommodate specific spacing/footprint requirements.

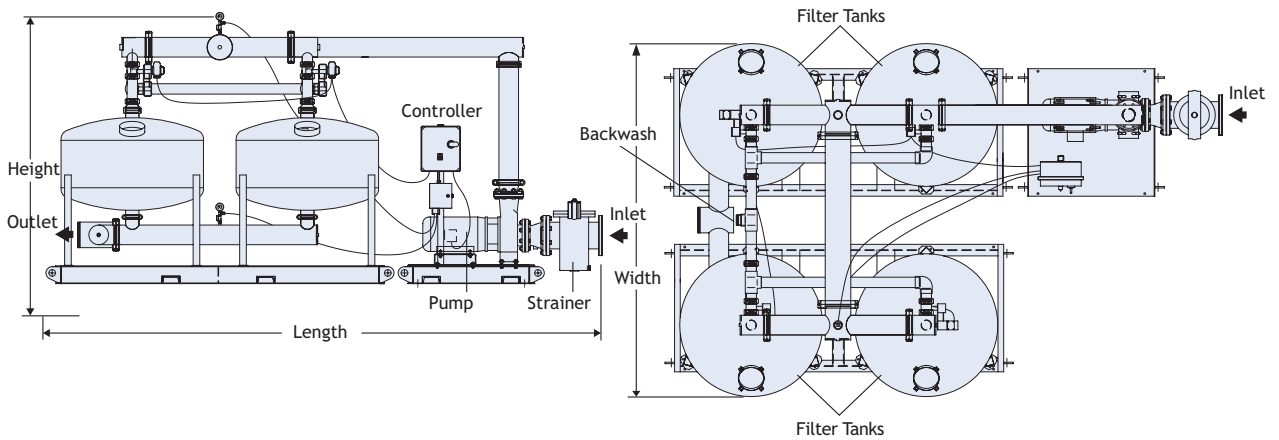
## STS-248 Series



## STS-348 Series

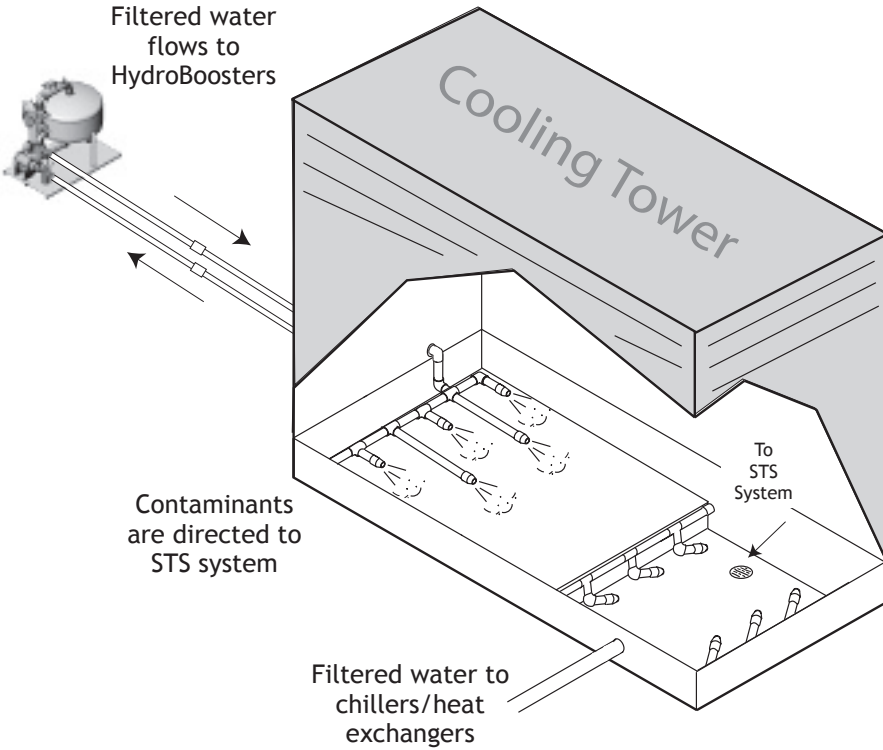


## STS-448 Series



# Basin Sweeping Options

## STS System Diagram



LAKOS Offers STS Systems For Basin Sweeping With Higher Pressure Pumps. Consult LAKOS for Design Requirements.

Basin Sweeping Options Available On 24 to 48 Inch Tanks

Model	Pump Hp	Maximum Number of HB-10-K HydroBoosters
STS-24-075/SWP	3	6
STS-30-110/SWP	5	8
STS-36-165/SWP	5	14
STS-48-310/SWP	10	24

## HydroBoosters

Directed turbulence maximizes cleaning efficiency in the tower basin/remote sump. LAKOS HydroBoosters provide that turbulence with patented vortexing action as shown. Swivel clips are available as shown in the picture below. Many cooling tower manufacturers offer factory-installed basin sweeping piping. Please consult LAKOS for proper equipment selection.

Model	Connection Size (inches)	Extension Size (minimum)	Flow Input and Output
HB-10-K	3/4" male NPT	3/4"	10 US gpm and 60 US gpm 2 m <sup>3</sup> /hr and 12 m <sup>3</sup> /hr
HB-18-K	3/4" male NPT	1"	18 US gpm and 108 US gpm 4 m <sup>3</sup> /hr and 24 m <sup>3</sup> /hr
HB-35-K	1" male NPT	1 1/4"	35 US gpm and 210 US gpm 8 m <sup>3</sup> /hr and 48 m <sup>3</sup> /hr
*TSN-0025-B	1/4" male NPT	—	4.2 US gpm 1 m <sup>3</sup> /hr

**NOTE:** These flow rates are based on an input pressure of 20 psi (1.4 bar)  
Minimum water level above centerline of HydroBooster should be 2 inches

\* This is a flat-fan spray nozzle (brass) for use in applications with a shallow deck in the basin. May be combined with HydroBoosters

Flow boosted to 6 U.S. gpm through HydroBooster

1 U.S. gpm enters HydroBooster



HydroBooster with swivel clip

## Equipment Specifications

CSI specifications are available for download from [www.lakos.com](http://www.lakos.com)

### Limited Warranty

All products manufactured and marketed by this corporation are warranted to be free of defects in material or workmanship for 12 months from date of installation; if installed 6 months or more after ship date, warranty shall be a maximum of 18 months from ship date.

If a fault develops, notify us, giving a complete description of the alleged malfunction. Include the model number(s), date of delivery and operating conditions of subject product(s). We 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).

1365 North Clovis Avenue  
Fresno, California 93727 USA  
Telephone: (559) 255-1601  
FAX: (559) 255-8093  
Toll Free: (800) 344-7205  
(USA, Mexico & Canada)  
Internet: [www.lakos.com](http://www.lakos.com)  
E-mail: [info@lakos.com](mailto:info@lakos.com)

#### Maximum System Pressure:

100 psi (6.9 bar), except model STS-48-310 and larger: 80 psi (5.5 bar).

#### Filter Tank:

304-L stainless steel with grooved pipe connections at inlet and outlet. Minimum wall thickness: Domes at 14 gauge; walls at 14 gauge. Top inspection port shall feature an epoxy-coated, cast iron bolt-on cover.

Lower clean-out port is female coupling with plastic (PVC) plug.

#### Pump:

End-suction, single stage; TEFC motor, cast iron housing; iron impeller; bronze shaft sleeve; BUNA-N mechanical shaft seal; flooded suction required.

#### Backwash Valves:

Electrically-actuated, mechanically-linked butterfly valves. One actuator for single tank systems, one actuator per tank for multi-tank systems.

#### Underdrain:

Schedule 40 PVC header. PVC internally v-slotted well screen (.010 slot opening size) with a minimum collapse strength of 135 psi (9.3 bar). Durability shall be warranted for 15 years.

#### Controller:

IEC starter with overload module; HOA selector switch; NEMA-4X enclosure; re-set/disconnect/trip switch; 120 volt, single phase control voltage; manual backwash switch; pressure differential switch; backwash cycle timer; 24-hour backwash clock.

#### Piping:

Galvanized pipe with grooved coupling.

#### Strainer:

Cast-iron basket strainer.

#### Filter Media:

- Uniformly graded silica sand media:
- 10 microns at 95% efficiency - standard
  - 5 microns at 90% efficiency - optional

#### Skid:

Stainless steel, 3/16-inch minimum thickness. Multi-tank systems utilize carbon steel I-beam and plate material.

#### Options:

- Backwash Tank (vertical) with capacities up to 3000 gallons
- High/Low Water (Backwash Tank) Level Switches
- Status Lights

#### PLC Option:

Programmable relay. Preprogramed at factory. Standard configuration includes:

- Backwash every 24 hours
- Allen-Bradley PLC

Additional capabilities can be programed into the PLC. Consult LAKOS for more information.

Lakos Separators are manufactured and sold under one or more of the following U.S. Patents: 3,289,608; 3,512,651; 3,568,837; 3,701,425; 3,947,364; 3,963,073; 4,027,481; 4,120,795; 4,123,800; 4,140,638; 4,147,630; 4,148,735; 4,305,825; 4,555,333; 5,320,747; 5,338,341; 5,368,735; 5,425,876; 5,571,416; 5,578,203; 5,622,545; 5,653,874; 5,894,995; 6,090,276; 6,143,175; 6,167,960; 6,202,543; Des. 327,693; and corresponding foreign patents, including 600 12 329.4-08 (Germany) and EP 1 198 276 B1 (EU); other U.S. and foreign patents pending.