LAKOS
FILTRATION SOLUTIONS

Installation and Operators Manual

Model: CT/CTS Series Sand Media Filter

FRESNO, CALIFORNIA, USA

LS-722C (Rev. 6/26)

LAKOS CT/CTS Series Sand Media Filter IOM
Installation / Operation / Maintenance

Introduction

LAKOS® filtration equipment has been designed to give long, trouble-free service when properly installed, operated and maintained. This manual contains important installation procedures and should be read prior to installing. This manual is also a guide for proper filter operation maintenance and winterizing. It is important that maintenance personnel review this manual carefully, including the Safety Precautions and Warnings before performing any maintenance on this sand media water filter.

Note that the recommendations on the frequency 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 in this manual. If additional information beyond the scope of this manual is required, contact your local LAKOS® Representative or the factory.

General Description

The CT/CTS Series Sand Media Filters are permanent media type units specifically designed to clean process water. The filters may be used for both side-stream and full stream applications in pressurized and non-pressurized systems. Standard CT/CTS series filter vessels are rated for 80 psig (5.5 bar) for the 42" and 48" tanks, and 50 PSI (3.5 bar) for the 54" thru 96" tanks. All pressure ratings are based on a maximum temperature of 100 degrees Fahrenheit. LAKOS® can provide tanks with higher pressure ratings, as well as ASME Code design and construction. Please contact the factory for details and pricing.

CT systems are provided with a tank, valves w/ face piping, and control panel for backwash valve operation. CTS systems are provided with a tank, valves w/ face piping, pump/motor, and control panel for backwash & pump operation. CT systems are available in sizes from 54" thru 96". CTS systems are available in sizes from 42" thru 90".

Filter Operation

Water from the system is pumped through the over-drain assembly at the top of the filter tank and distributed evenly over the media. Unfiltered water flows downward through the filter media where suspended particles are trapped. The filtered water then passes through the vessel and out the under-drain 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 7-10 PSI flow is reversed through the tank by repositioning the valves automatically or manually. The media is backwashed with a rigorous scouring action, releasing trapped particles within the media. The dirty water passes from the filter vessel through the over-drain assembly at the top of the vessel and flows to drain. After the backwash cycle (field adjustable and factory pre-set at 3 minutes), the filter valves are again repositioned and the filtration cycle is resumed.

Installation

Before you begin….

CAUTION!!! Water sources vary and may contain impurities that can adversely affect a filter system. Minerals, biological microbes and other impurities must be identified and addressed by each user on a case-by-case basis. Contact your filtration system dealer for addition information and recommendations.

CAUTION!!! Please review installation and operations manuals of individual parts within the system. This manual may not cover all processes and/or procedures of these parts.

Unpacking

When the LAKOS® Industrial Media Filter is delivered to the jobsite, it should be inspected thoroughly to ensure that all required items have been received and that filter equipment is free of any damage that may have occurred in transit. Any damage must be noted on the bill of lading at the time of receipt. Otherwise, there is no recourse to recover the cost of damaged goods.

The filter model number appears on a nameplate located on the unit and should be checked against the invoice/packing list.

Rigging

CT/CTS filters 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. If no skid is supplied, lift from the lifting lugs located on the filter vessel top.

LAKOS CT/CTS Series Sand Media Filter IOM
Installation / Operation / Maintenance

All LAKOS® CT/CTS sand media filters should be rigidly anchored to the floor or support steel by means of anchor bolts. All CT/CTS filters have an anchoring provision.
Once the filter in installed in its permanent location, the pressure gauge and air relief valves should be installed on the top of the filter tank (some units will have these items already installed). The sand media is loaded into the filter next. Refer to the section in this manual "Loading the Media" for the proper loading procedure and the appropriate quantity of media necessary for each size filter vessel.

Piping

The CT/ CTS should be installed using the pipe size indicated in **Table 2**.

Connect the unfiltered source water from the system sump or piping to the connection labeled "Inlet". **NOTE**: All CTS systems have end suction centrifugal style pumps that require flooded suction for proper operation. Piping to the pump suction inlet should be plumbed to ensure the pipe is full of water at all times.

Connect the return line from the connection labeled "Outlet" to the system sump or filtered water return piping.

A service or isolation valve should be installed on the inlet, outlet and city water line (if city water is used) to allow filter servicing. For units using a backwash source other than the system sump, refer to Table 3 for the required backwash flow rate. The maximum city water backwash supply pressure on the CT/CTS filter vessel should never exceed the vessel pressure rating (50 PSI as standard). If public or municipal water is used for backwash, a back/low prevention device or check valve is required on the city water line (in accordance with local or other governing codes).

A Backwash Throttle Valve should be placed on the backwash discharge manifold to control the volume of water that can escape during backwash. Obtaining the proper flow rate of the backwash water is essential for effective flushing of the media. Too high of a flow will flush all of the media out of the tank. Too low of a flow will not allow the media to gently lift, fluidize and flush filtered particulates from the media in the system. The proper flow rate is dependent on the size of the tank being flushed. The most common way to adjust the backwash throttle valve is to manually set the filter(s) to backwash with the throttle valve fully closed. Slowly open the throttle valve until small amounts of media are evident in the backwash discharge. It is desirable to have a slight amount of media discharge during backwash. You should expect to lose several inches of sand per year with proper backwashing. Although the media fills 2/3rd of the tank, it makes most sense to try to keep the contamination in the top two inches of the media bed. This will allow you to quickly rinse the sand during the backwash sequence. If the media contamination reaches depths bellow two inches, it will take a much longer backwash to rinse the media. This can also cause contamination of the under drain of your filter system. Proper backwash frequency must be determined to minimize contamination and clogged under drains.

Refer to **Table 3** 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 backwash water holding tank to buffer the backwash flow rate from the filter to the waste drain. A valve can be used to regulate the flow from the holding tank at a reduced flow rate that is suitable for the drain. Do **not** reduce the waste line pipe to regulate backwash flow rate as this will adversely affect the backwash cycle and cause accumulated waste in the filter vessel.

All inter-connecting piping, fitting, valves, or other accessories connected to the filter system (whether supplied by LAKOS® or others) must be independently supported to eliminate stress on piping. Check with local or other governmental authority to ensure compliance with applicable codes.

All CT/CTS filter vessels have a drain plug located on the bottom.

Electrical

It is highly recommended that all electrical hook-ups to the CT/CTS system be done by a qualified electrician. The control panel supplied on each LAKOS CT/CTS system will have a wiring diagram inside which reference all electrical power requirements (voltage, hertz, etc..) and should be used by the electrician. If your system does not have this paperwork, please contact the factory for a copy before any further work is performed. **Table 5A & 5B** can be used as a reference for CTS pump motors, but always check and use the supplied pump motor nameplate values. These values will vary between all motor manufacturers.

Loading the Filter Media

The special sand media used in CT/CTS media filters is shipped in once cubic foot bags and each bag weights 100 lbs. Refer to **Table 3** for media loading quantities. Media quantity may vary with vessel pressure ratings. Correct quantities will be noted on the shipping and inspection records for each filter system.

! Important ! To avoid damage to the filter under-drain, the filter vessel must be filled with water (1/3 ~ ½ full) before loading media into the vessel. The under-drain support media is loaded first (***see note below***). For single applications, the silica sand is loaded next. Check filter internals for damage before loading the media.

LAKOS CT/CTS Series Sand Media Filter IOM
Installation / Operation / Maintenance

NOTE: *The CTS-42 & CTS-48 do not require a separate under-drain support media. These tanks only use the silica sand for operation.*

Start-up & Operation

Initial and Seasonal Start-up

Before initial start-up or after a down period, the filter should be thoroughly inspected and cleaned.

! Caution, Safety First ! The first five steps in the following procedure must be performed with the electric power off, locked and tagged at the main panel. Maintenance personnel should follow the recommended safety precautions found in the Safety Precautions section in the manual prior to initial and seasonal start-up.

CT Tanks (tanks only – no pump)

1. Loosen the access port and man hole covers and lubricate the bolts if necessary.
2. Inspect the over-drain assembly and media. If the media is contaminated, remove the foreign material or replace the media. Replace the access port and manway covers.
3. Open the air relief valve on top of the filter tank and start flow from source.
4. Set pneumatic regulator to 15 PSI as indicated by the gauge on the regulator. Run a test on the valve operation to ensure that enough air and pressure is available.
5. Differential pressure switch comes set from the factory at 13 PSI.
6. With the air relief valve open, check the shut-off valves in the filter inlet and outlet water lines to verify they are open. Allow the filter vessel to fill. Close the manual air relief valve on op of the vessel after all air has been vented from the vessel.
7. Check the voltage and current to the control panel for proper voltage and amps.
8. Check the unit for any air or water leaks. Any air leaks in the pump suction piping must be found and repaired. Failure to do so could result in poor performance and/or personal injury.
9. Backwash the filter 3-4 times initially to remove any fine grit or contaminants that may be in the media. After backwashing the filter, check the pressure gauge on top of the filter tank and record the clean media operating pressure gauge (inlet gauge). The media should be backwashed whenever the pressure drop across the filter media reaches 13 psig, or every 24 hours, whichever occurs first.

CTS System (tank and pump)

1. CTS filter with pre-strainers: Make sure water supply to pump suction is shut off to prevent flooding. Loosen the bolts around the pump pre-strainer tank lid. Remove the lid, inspect the O-ring seal and lubricate. Remove debris from the pump pre-strainer basket. Replace the basket, lid and bolts. Open water supply shut off valve to ensure pump suction is flooded.
2. Turn the pump and motor shaft by hand to ensure free rotation.
3. Loosen the access port and manway covers and lubricate the bolts if necessary.
4. Inspect the over-drain assembly and media. If the media is contaminated, remove the foreign material or replace the media. Replace the access port and manway covers.
5. Open the 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!** If rotation is backward, have a qualified electrician change pump motor leads to correct rotation.
6. Set pneumatic regulator to 15 PSI as indicated by the gauge on the regulator. Run a test on the valve operation to ensure that enough air and pressure is available.
7. Differential pressure switch comes set from the factory at 13 PSI.

8. With the air relief valve open, 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 allow the filter vessel to fill. Close the manual air relief valve on op of the vessel after all air has been vented from the vessel.

9. Check the voltage and current of all leads on the pump motor. The current draw should not exceed the pump motor nameplate rating. Check for any unusual noise or vibrations.

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

11. Backwash the filter 3-4 times initially to remove any fine grit or contaminants that may be in the media. After backwashing the filter, check the pressure gauge on top of the filter tank and record the clean media operating pressure gauge (inlet gauge). The media should be backwashed whenever the pressure drop across the filter media reaches 13 psig, or every 24 hours, whichever occurs first.

After First Hour of Operation

1. With the filter pump running, open the air relief valve on top of the filter vessel. Close the valve after the air has been purged from the system. Excessive air release generally indicates a leak, which must be repaired. Air accumulation in the filter vessel can result in an unsafe condition due to the stored high energy potential of any compressed air within the vessel.
2. Again, check the unit for any unusual noise or vibration.
3. Again, check unit for any air or water leaks.

Operation

During operation, to ensure long term dependable operation, the filter should be inspected, cleaned and lubricated on a regular basis. The required service functions and recommended frequency (minimums) for each are shown in the Operating and Maintenance **Table 1**. If any problems occur, please refer to **Table 7** for **Trouble Shooting Procedures**. If you have any questions, please contact the factory.

Cold Weather Operation

LAKOS® industrial media 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 water from freezing in a filter. When indoor installation is impractical because of filter location or space limitations, supplemental head must be supplied through the use of electrical heater tape and insulation. The parts of the filter that must be head traced and insulated are: pump, pump pre-strainer, pump piping and valves, differential pressure switch tubing and filter vessel. The unit should be drained when it is to be shut down for any period of time. Refer to the following (Seasonal Shutdown) section in this manual for recommendations.

Seasonal Shutdown

The following services should be performed when the unit is to be taken out of service for an extended 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. Loosen the bolts that hold the filter vessel access covers in place and remove the cover. Lubricate the bolts if necessary. Replace the cover gaskets if necessary.
5. Inspect the over-drain assembly and media pack. If the media in contaminated, remove the foreign material and replace the filter media if necessary. Replace the filter vessel access covers and secure the bolts.

LAKOS CT/CTS Series Sand Media Filter IOM
Installation / Operation / Maintenance

Maintenance Procedures

Refer to **Table 1** for suggested operation and maintenance schedules of LAKOS® CT/CTS systems.

Pump Pre-strainer (if equipped)

Warning: Disconnect all electrical power prior to performing pump maintenance. The filter pre-strainer basket on the pump inlet must be checked regularly and kept free of debris. Failure to do so may damage the pump and/or motor. Shut off the power, close the valves, open the manual air relief valve, and remove bolts and the pre-strainer cover. Lift the basket out of the housing and remove any foreign material. Replace the basket, lubricate the O-ring, install the cover and tighten the bolts.

Backwashing

Differential pressure across the filter media progressively increases as trapped particulate accumulate in the filter media bed. On filter equipped with automatic backwash, the backwash cycle is initiated upon reaching a 13 psig pressure differential. Since units with automatic controls perform this function as necessary, a detailed backwash procedure is only provided for manual units. However, automatic units can be manually backwashed by pressing the manual push-button switch located on the control panel. The backwash cycle is field adjustable on most units and is factory set at three minutes. To prevent unfiltered water from "short circuiting" through the media and to extend media life, the filter should be backwashed regularly; at least once every 24-48 hours.

For manual backwash filters using backwash water source other than the unfiltered source water (e.g. city water):

Filter Vessel

The filter vessel 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. Remove the access port on the top of the tank to inspect the internal components.

Note: Always use care and follow proper shut-down procedures. Inspect the over-drain assembly for any debris, blockage or damage, and clean or replace if necessary. Remove and inspect the media. The CT/CTS filters have manyway parts located on the side of the tank ofr easy removal of the media and inspection of the under-drain assembly. Over a period of time, foreign matter may become embedded in the media pack that cannot be removed by backwashing. Contaminated media should be disposed in accordance with state and federal requirements. Unscrew the under-drain laterals and inspect for blockage or damage. Clean or replace if necessary. If replacement of one or more laterals is necessary, it is recommended to replace all laterals in the under-drain. Refill the vessel with the proper amount of new media, following the procedure for media loading.

Water Treatment

Filtration is an effective way of reducing and managing the level of contamination in a fluid system. Still, there are other components of equal importance in a water treatment program. For closed loop systems, often the water must be further treated to inhibit or prevent the deposition of dissolved solids on heat transfer surfaces. As water evaporates, without proper treatment, the concentration of dissolved solids increases and will result in scale build-up on heat transfer surfaces. Additionally, water often requires treatment for the control of corrosion, bacteria (including Legionella) and other biological contaminants.

To control all potential contaminants, a comprehensive water treatment program must be developed and employed. In some cases, a simple bleed-off in the system may be adequate for sale control. The filter backwash constitutes a portion of the bleed. For specific recommendations on water treatment, a water treatment professional should be consulted.

Factory Authorized Parts

Factory authorized parts are available through your LAKOS® representative. Please refer to **Table 6** for replacement parts. Contact the factory if assistance is required. Be sure to include the filter serial number and model when ordering parts.

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

1. O-ring or gasket for filter tank access port and man hole
2. O-ring seal or gasket for pump pre-strainer lid (if applicable).
3. Pump Repair Kit (mechanical seal) – for CTS systems only

LAKOS CT/CTS Series Sand Media Filter IOM
Installation / Operation / Maintenance

Safety Precautions

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

Filter system operation, maintenance and repair should be undertaken only by trained and qualified personnel. 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 n 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 of the filtration system. 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 re-circulating water system may contain chemicals or biological contaminants that could be harmful if inhaled or ingested. Accordingly, personnel that may be exposed directly to the mist produced by water jets or compressed air (if these are used to clean portions or components of the filter) should wear respirators with HEPA filters, NIOSH/MSHA approved number TC-21C-142/TC-21C-182.

Warranty Policy

Limited warranty LAKOS products are factory tested to meet the highest quality standards in the filtration industry. Please refer to www.lakos.com/warranty for information about the warranty on this and all other LAKOS products.

Table 1 – CT/CTS Operation and Maintenance Schedule

Type of Service	Start Up	Monthly	Semi-annually	Shutdown	Annually
General Condition of Unit	X	X			
Drain Condensate from air line to pneumatic actuator (if applicable)	As Required	As Required	As Required	As Required	As Required
Clean pre-strainer basket	As Required	As Required	As Required	As Required	As Required
Inspect gaskets	X		X	X	
Check pump shaft for free rotation	X		X		
Check operation of valves	X	X		X	
Check, lubricate clamp on filter tank access port				X	X
Inspect over-drain assembly & media pack	X			X	X
Check pump motor for proper rotation	X				
Check motor voltage & current	X	X	X		
Prime Pump	X				
Check pressure gauge reading (top of filter)	X	X			
Check unit for unusual noise or vibration	X	X			
Check unit for leaks	X	X			
Drain filter & piping				X	

Table 2 – CT/CTS Connection Sizes

Filter Model	Filter INLET Inches / mm	Filter OUTLET Inches / mm	Backwash OUTLET Inches / mm	Pump INLET (CTS) Inches / mm
CTS-42	----	3 / 76	3 / 76	3 / 76
CTS-48	----	3 / 76	3 / 76	3 / 76
CT/CTS-54	4 / 102	4 / 102	4 / 102	3 / 76
CT/CTS-60	4 / 102	4 / 102	4 / 102	3 / 76
CT/CTS-66	4 / 102	4 / 102	4 / 102	3 / 76
CT/CTS-72	6 / 152	6 / 152	6 / 152	4 / 102
CT/CTS-78	6 / 152	6 / 152	6 / 152	4 / 102
CT/CTS-84	6 / 152	6 / 152	6 / 152	4 / 102
CT/CTS-90	6 / 152	6 / 152	6 / 152	6 / 152

Table 3 – CT/CTS Flow Rates

Filter Model	Filtration Flow Rate GPM / lps	Backwash Flow Rate (minimum) GPM / lps	Backwash Flow Rate (maximum) GPM / lps
CTS-42	192 /	144 /	192 /
CTS-48	252 /	189 /	252 /
CT/CTS-54	318 / 20	254 / 16	318 / 20
CT/CTS-60	392 / 25	314 / 20	392 / 25
CT/CTS-66	474 / 30	380 / 24	474 / 30
CT/CTS-72	566 / 35	453 / 28	566 / 35
CT/CTS-78	664 / 42	530 / 33	664 / 42
CT/CTS-84	770 / 48	616 / 39	770 / 48
CT/CTS-90	884 / 56	707 / 44	884 / 56

Table 4 – Media Quantities for CT/CTS Filter Systems

Filter Model	Under-drain Support Base Media MediaGem475 Cu. Ft. / Pails	Standard 10 Micron Filtration MediaGem85 Cu. Ft.	Optional 5 Micron Filtration
CTS-42	Not Required	10.0	Contact Factory
CTS-48	Not Required	13.0	Contact Factory
CT/CTS-54	18.0 /	34.0	Contact Factory
CT/CTS-60	23.0 /	42.0	Contact Factory
CT/CTS-66	29.0 /	51.0	Contact Factory
CT/CTS-72	37.0	64.0	Contact Factory
CT/CTS-78	47.0	75.0	Contact Factory
CT/CTS-84	56.0	87.0	Contact Factory
CT/CTS-90	68.0	100.0	Contact Factory

PICTURES OF LOADING REQUIREMENST FROM LIT DRAWING

Table 5A – CTS Electrical Requirements – Three Phase, 60 Hz

Filter Model	Pump HP / Kw	Voltage (three phase) 60 Hz	Full Load Current ** Amps
CTS-42	5 / 3.7	208 / 230 / 460 / 575	16.8 / 15.2 / 7.6 / 6.1
CTS-48	5 / 3.7	208 / 230 /460 / 575	16.8 / 15.2 / 7.6 / 6.1
CTS-54	7.5 / 5.6	208 / 230 / 460 / 575	24.2 / 22 / 11 / 9
CTS-60	10 / 7.5	208 / 230 / 460 / 575	30.8 / 28 / 14 / 11
CTS-66	15 / 11.2	208 / 230 / 460 / 575	46.2 / 42 / 21 / 17
CTS-72	15 / 11.2	208 / 230 / 460 / 575	46.2 / 42 / 21 / 17
CTS-78	20 / 15	208 / 230 / 460 / 575	59.4 / 54 / 27 / 22
CTS-84	20 / 15	208 / 230 / 460 / 575	59.4 / 54 / 27 / 22
CTS-90	25 / 18.6	208 / 230 / 460 / 575	74.8 / 68 / 34 / 52

***NOTE: FLA VALUES SHOWN ARE FOR REFERENCE ONLY AND WILL VARY BETWEEN MOTOR MANUFACTURERS. PLEASE REFERENCE MOTOR NAMEPLATE FOR ACTUAL VALUES.*

Table 5B – CTS Electrical Requirements – Three Phase, 50 Hz

Filter Model	Pump HP / Kw	Voltage (three phase) 50 Hz	Full Load Current ** Amps
CTS-42	5 / 3.7	380 / 415	9.2 / 8.4
CTS-48	5 / 3.7	380 / 415	9.2 / 8.4
CTS-54	7.5 / 5.6	380 / 415	13.3 / 12.2
CTS-60	7.5 / 5.6	380 / 415	13.3 / 12.2
CTS-66	10 / 7.5	380 / 415	17.0 / 15.5
CTS-72	10 / 7.5	380 / 415	17.0 / 15.5
CTS-78	15 / 11.2	380 / 415	25.4 / 23.3
CTS-84	15 / 11.2	380 / 415	25.4 / 23.3
CTS-90	15 / 11.2	380 / 415	25.4 / 23.3

***NOTE: FLA VALUES SHOWN ARE FOR REFERENCE ONLY AND WILL VARY BETWEEN MOTOR MANUFACTURERS. PLEASE REFERENCE MOTOR NAMEPLATE FOR ACTUAL VALUES*

Table 6 – Replacement Parts

Over-Drain

FILTER MODEL	REF #	LAKOS PART #	MATERIAL
CTS-42			
CTS-48			
CT/CTS-54	1	125802	Schedule 80 PVC
CT/CTS-60	1	125803	Schedule 80 PVC
CT/CTS-66	1	125804	Schedule 80 PVC
CT/CTS-72	1	125805	Schedule 80 PVC
CT/CTS-78	1	125806	Schedule 80 PVC
CT/CTS-84	1	125807	Schedule 80 PVC
CT/CTS-90	1	125808	Schedule 80 PVC
CT/CTS-96	1	125809	Schedule 80 PVC

Under-Drain (Headers & Laterals)

FILTER MODEL	REF #	LAKOS PART #	MATERIAL
CTS-42			
CTS-48			
CT/CTS-54	2	126195	Schedule 80 PVC
CT/CTS-60	2	126196	Schedule 80 PVC
CT/CTS-66	2	126197	Schedule 80 PVC
CT/CTS-72	2	126198	Schedule 80 PVC
CT/CTS-78	2	126199	Schedule 80 PVC
CT/CTS-84	2	126200	Schedule 80 PVC
CT/CTS-90	2	126201	Schedule 80 PVC
CT/CTS-96	2	126202	Schedule 80 PVC

Butterfly Valve

FILTER MODEL	REF #	LAKOS PART # / Description	MATERIAL
CT/CTS-54 thru 66	3	126782 / 4” Diameter	Ductile Iron / EPDM Seats
CT/CTS-72 thru 90	3	125850 / 6” Diameter	Ductile Iron / EPDM Seats
CT/CTS-96	3	125788 / 8” Diameter	Ductile Iron / EPDM Seats

Table 6 – Replacement Parts (cont.)

Valve Linkage Kits**

FILTER MODEL	REF #	LAKOS PART # / Description	MATERIAL
CT/CTS-54 thru 66	4	126763	Stainless Steel
CT/CTS-72 thru 90	4	126764	Stainless Steel
CT/CTS-96	4	126765	Stainless Steel

** All CT/CTS Valve Linkage Operation is Automatic – No Manual option is available

Actuator – Electric Style

FILTER MODEL	REF #	LAKOS PART # / Description	MATERIAL
CTS-42 & 48	5	126758 / 4”	Vendor Standard

Actuator – Pneumatic Style

FILTER MODEL	REF #	LAKOS PART # / Description	MATERIAL
CT/CTS-54 thru 66	5	126758 / 4”	Vendor Standard
CT/CTS-72 thru 90	5	125795 / 6”	Vendor Standard
CT/CTS-96	5	125795 / 8”	Vendor Standard

Actuator Mounting Bracket

FILTER MODEL	REF #	LAKOS PART # / Description	MATERIAL
CT/CTS-54 thru 66	6	126739	304L Stainless Steel
CT/CTS-72 thru 90	6	125845	304L Stainless Steel
CT/CTS-96	6	125794	304L Stainless Steel

Differential Pressure Switch

FILTER MODEL	REF #	LAKOS PART # / Description	MATERIAL
CT/CTS-54 thru 96	7	125453	Vendor Standard

Pressure Gauge

FILTER MODEL	REF #	LAKOS PART # / Description	MATERIAL
CT/CTS-54 thru 96	8	106262 / 100 PSI 2-1/2” Dial	SS-Brass / Glycerine Filled

Table 6 – Replacement Parts (cont.)

Man Way Access Cover Gasket

FILTER MODEL	REF #	LAKOS PART # / Description	MATERIAL
CT/CTS-54 thru 96	9	126740	EPDM

Air Vent Kit (Autovent)

FILTER MODEL	REF #	LAKOS PART # / Description	MATERIAL
CT/CTS-54 thru 96	11	125797 / 150 PSIG Rated	Brass

Pump Repair Kits

FILTER MODEL	REF #	LAKOS PART # / Description	MATERIAL
CTS-54	12	104111 / #15 - JM Frame	BN-CM Seal
CTS-60	12	102784 / #56 - JM Frame	BN-CM Seal
CTS-66	12	102784 / #56 - JM Frame	BN-CM Seal
CTS-72	12	104113 / #57 - JM Frame	BN-CM Seal
CTS-78	12	104113 / #57 - JM Frame	BN-CM Seal
CTS-84	12	104113 / #57 - JM Frame	BN-CM Seal
CTS-90	12	104114 / #59 - JM Frame	BN-CM Seal
CTS-96	12	104114 / #59 - JM Frame	BN-CM Seal

All kits include: (1) shaft sleeve, (1) impeller retainer, (1) shaft o-ring, (1) flinger, (1) case gasket, (1) mech. seal

Table 7 – Troubleshooting CTS Sand Media Systems

PROBLEM	POSSIBLE CAUSES	SOLUTIONS
Poor Filtration	● Excessive flow through filters, causing "coning" of media sand and/or forcing contaminants through filter outlet. ● Air in tank(s) may cause disruption of the media sand bed. ● Incorrect media sand. ● Excessively high pressure differential before backwashing, which forces contaminants through filter bed. ● Insufficient volume of media in filter, which allows contaminants to pass through the system.	1. Install throttling valve to control flow. 2. Bleed off trapped air in system. 3. Replace with proper media sand. Consult your LAKOS representative. 4. Backwash more often at lower differential pressure. 5. Add proper sand media to tank(s) to specified level.
Consistently High Pressure Differential	● Excessive contaminant load restricts flow through the filters and prevents sufficient flow for backwashing. ● Insufficient backwash flow. ● Inadequate media sand volume, which may minimize coverage of backwash flow across filter bed, creating dead spots of accumulated contaminants.	1. Drain tank and remove manway access ports. Carefully skim away any excess or caked contaminants from the media sand bed's surface. Return tank to normal service and backwash system. 2. Check backwash valve linkage for proper operation. 3. Add sand media as necessary.

Table 7 – Troubleshooting CTS Sand Media Systems (cont.)

Increasing Frequency of Backwash Cycle	● Backwash flow or duration is not adequate to flush filter tanks of all contaminants. ● Insufficient sand volume. ● Increased concentration of contaminants in water supply.	1. Adjust backwash flow or duration. 2. Add media sand to achieve proper volume. 3. Adjust backwash frequency or reduce pressure differential setting to achieve more frequent backwash cycles.
Automatic Backwash Fails to Cycle	● Controller power may be off or circuit fuses tripped. ● Improper setting of differential switch. ● Solenoid malfunctioning. ● Loss of sufficient pressure to actuate valve(s).	1. Be sure wiring is connected correctly. Replace circuit fuses. Turn on power. Controller may be faulty and need replacement. 2. Adjust as necessary. 3. Check connections, clean ports and check for the sound of the solenoid actuating. Replace solenoid if necessary. 4. Check air regulator for proper adjustment. Check air lines for leaks.
Media Sand Appears Downstream	● Incorrect media sand (i.e. too fine and too small) ● Broken, damaged, or missing lateral.	1. Replace media with proper sized media. 2. Repair or replace laterals of the underdrain.
Backwash Valve Leaks	● Obstruction in the valve seat. ● Rubber seating is worn or damaged. ● Actuator Diaphragm damaged. ● Linkage out of adjustment	1. Remove the obstruction. 2. Replace Valve. 3. Replace diaphragm. 4. Adjust linkage
Water Hammer	● Air in tanks. ● Long backwash line causing vacuum.	1. Bleed off trapped air in system. Air vent on system may be required. 2. Install vacuum breaker on backwash line.

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