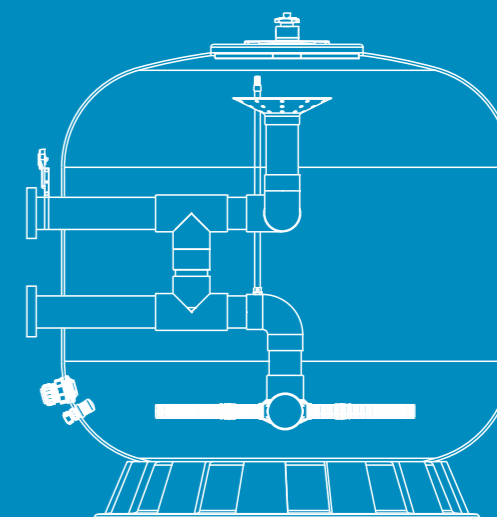




# VERTICAL COMMERCIAL FILTER

Installation and Operation Manual



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## USER MANUAL

 STRIVE FOR CLEAR WATER

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## IMPORTANT SAFETY INSTRUCTIONS



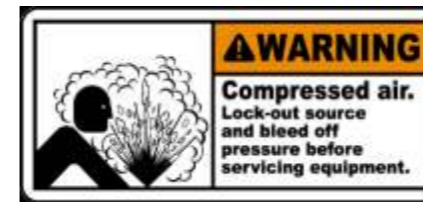
THESE OPERATING INSTRUCTIONS CONTAIN IMPORTANT INFORMATION ON THE SAFE, PROPER AND ECONOMICAL OPERATION OF THIS SWIMMING POOL APPLIANCE. STRICT OBSERVATION OF THE OPERATING INSTRUCTIONS WILL HELP TO AVOID DANGERS, REDUCE REPAIR COSTS, SHUTDOWN TIMES AND INCREASE THE RELIABILITY AND WORKING LIFE OF THE PRODUCT.

Failure to follow the instructions in this manual may result in serious adverse health effects, or even serious or fatal injury. Failure to follow the instructions in this manual will in all cases invalidate all guarantees and liability on the part of the manufacturer.

Consumer Information and Safety

This Fabric Glass Filament Wiring Sand Filters are designed and manufactured to provide years of safe and reliable operation. Operated and maintained according to the information in this manual and the installation codes referred to in later sections.

## THIS FILTER OPERATES UNDER HIGH PRESSUR



When any part of the circulating system, (e.g., closure, pump, filter, valve(s), etc.), is serviced, air can enter the system and become pressurized. Pressurized air can cause the top closure to separate which can result in severe injury, death, or property damage. To avoid this potential hazard, follow these instructions: ?

1. If you are not familiar with your pool filtering system :
2. Do NOT attempt to adjust or service without consulting your dealer, or a qualified pool technician.
3. Read the entire Installation & Operation Manual before attempting to use, service or adjust the pool filtering system.
4. Before repositioning valve(s) and before beginning the assembly, disassembly, or any other service of the circulating system:
  - (1) Turn the pump OFF and shut OFF any automatic controls to ensure the system is NOT inadvertently started during the servicing;
  - (2) open the manual air release valve;
  - (3) Wait until all pressure is relieved.
5. Whenever installing the filter closure follow the filter closure warnings exactly.
6. Once service on the circulating system is complete follow initial start-up instructions exactly.
7. Maintain circulation system properly. Replace worn or damaged parts immediately, (e.g., closure, pressure gauge, valve(s), O-rings, etc.).
8. Be sure that the filter is properly mounted and positioned according to instructions provided.



### WARNING:

This filter must be installed by a licensed or certified electrician or a qualified pool serviceman in accordance with the Local Code and all applicable local codes and ordinances.

Improper installation could result in death or serious injury to pool users, installers, or others and may also cause damage to property.

Always disconnect power to the pool circulating system at the circuit breaker before servicing the filter. Ensure that the disconnected circuit is locked out or properly tagged so that it cannot be switched on while you are working on the filter. Failure to do so could result in serious injury or death to serviceman, pool users or others due to electric shock.



**WARNING:**

Do not operate the filter until you have read and understand clearly all the operating instructions and warning messages for all equipment that is a part of the pool circulating system. The following instructions are intended as a guide for initially operating the filter in a general pool installation. Failure to follow all operating instructions and warning messages can result in property damage or severe personal injury or death.



**WARNING:**

To reduce the risk of injury, do not permit children to use this product unless they are closely supervised at all times.



Due to the potential risk that can be involved it is recommended that the pressure test be kept to the minimum time required by the local code. Do not allow people to work around the system when the circulation system is under pressure test. Post appropriate warning signs and establish a barrier around the pressurized equipment. If the equipment is located in an equipment room, lock the door and post a warning sign.

Never attempt to adjust any closures or lids or attempt to remove or tighten bolts when the system is pressurized. These actions can cause the closure to separate and could cause severe personal injury or death if they were to strike a person.



Never exceed the maximum operating pressure of the system components. Exceeding these limits could result in a component failing under pressure. This instantaneous release of energy can cause the closure to separate and could cause severe personal injury or death if they were to strike a person.

## 1. VERTICAL SAND FILTER OVERVIEW

The filter is designed to provide water filtration for pools and water parks, as well as for water treatments that eliminates suspended matter with properly reduced filtration element. Besides the filter itself some other factors such as chemical liquid treatment, pump equipment, pipelines and general hydraulic design must be taken into account for filtration and depuration process because they can also influence the proper filter operation.

The filtration quality depends on different parameters such as depth of filtration bed, characteristics, quality and grade of filtration media etc, as well as filtration rate.

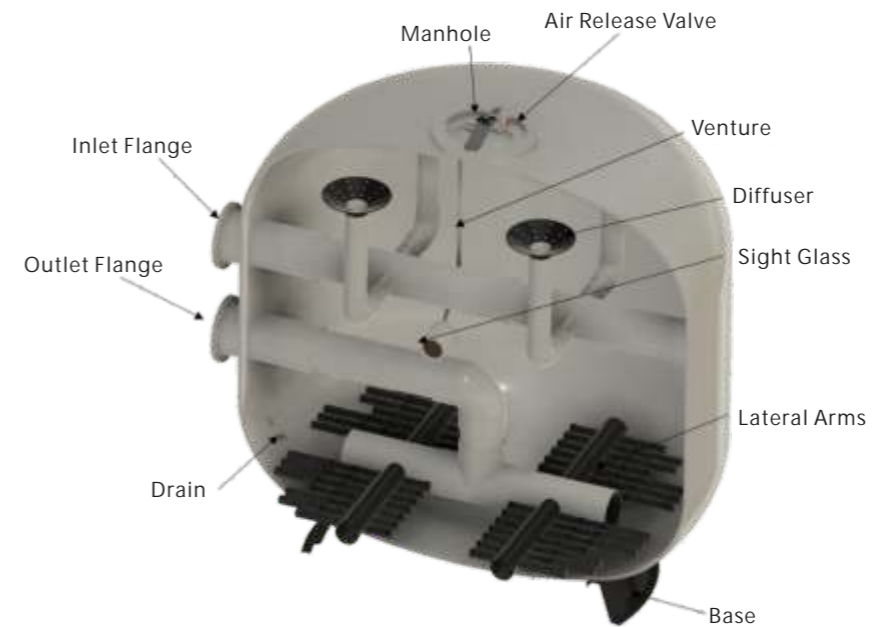
Manufactures in polyester resin & fiber glass with fiber glass winding structural reinforcement.

The maximum diameter is up to 3m and length 10m. The media bed depth depend on the size could be from 0.6m to 1.5m to meet the accurate application environments.

Different operation pressure available from 2.5 bar (250kPa) to 4.0 bar (400kPa).

The filter can be used multimedia layers, media distribution as collectors covered with gravel size 1-2 mm, or 3-5 mm. then upper layer 0.45-0.8 mm granulometry. Silica sand, crushed glass as well anthracite can be used. Load media weights are calculated using silica sand, for crushed glass reduce the weight a 10%.

The maximum design flow velocity is 50m<sup>3</sup>/h/m<sup>2</sup>. Maximum water temperature is 43°C.



With upper individual diffuser for uniform water distribution and laterals or Nozzle system for filtered water collection. Options available: Sight-glass, man-hole, manual air-release valve, bigger bottom drain.

## 2. PACKING AND LOADING

Filters are delivered properly packed and ready in order to facilitate unloading and transport using fork-lift truck, crane, etc. It is very important to make sure that the filters have not suffered bumps during transport.

The filter is packed on a reinforced steel platform and covered by plastic sheet to protect from water and other damage.

The hoisting point locate at the top of the filter packing.

Hoisting Point



**WARNING:**

Note:

1. Ensure the filter is on a level pad/base to promote an even water flow over the media bed.
2. Where necessary ensure that a foot valve (non return valve) is installed when using a pump that is installed above 24" from water source.
3. Ensure that a pressure-limiting valve is installed if using mains water or a high pressure pump.

Pipe run:

Minimize the length of pipe and particularly 90° fittings to obtain the least amount of friction loss as possible. Always use sufficient pipe supports to minimize stress on pipe joints or filter bulk head fittings. This will ensure maximum efficiency.



**WARNING:**

Isolation valves:

If filtration system is to be installed below water level or is supplied from mains water, shut off valves should be installed before the filter and after the filter. This will prevent water flow during any routine maintenance that may be required.

It is acceptable to place the filters under the water level. However if vacuum occurs in the installation, isolation valve must be installed to avoid that depression could collapse the filter's tanks.



**WARNING:**

UV Exposure:

It is suggested to paint an anti UV coating on the surface of the tank to prevent structural damage by long time UV light exposure to ensure maximum life span.

## 3. INSTALLATION

1. The filter must be placed on a location that is free from flooding area.
2. The filters must be placed on a flatted level concrete surface to prevent any strain from the attached plumbing and other equipment's.
3. The filter foundation should be strong enough to support the operational weight of the filter with water inside the filter tank.
4. The filter has to been placed for easy accessible for butterfly valve operation,
5. The filter has to been reserved sufficient clearance around for service access, such as manhole, sight glass, drain and etc.
6. The filter location must provide a drain to allow, in case of accident, evacuation of water flowing from any tube, filter, pump, etc. this will avoid risk of damages in the electrical installations (pumps, electric panels, etc.)
7. It is better to have the filter close to the water source as possible for maximum operation.

### 3.1 MANO METERS

It is pre-installed between the inlet and outlet piping.

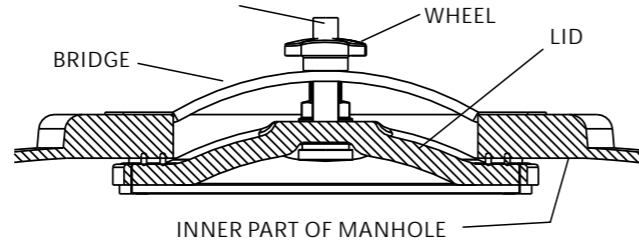
Pressure Reading, for pools filters application, the normal Inlet pressures of clean water clean is: 0.8-1 Kg/cm<sup>2</sup>. Record it and check the differential pressure between the inlet and outlet, two manometers, is 1 Kg/cm<sup>2</sup> or higher, backwash must be carried out.



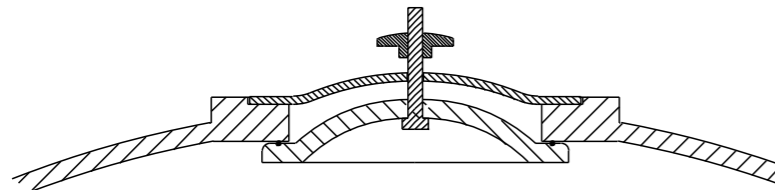
### 3.2 MANO METERS



Always stop the pump from the circuit breaker side and release the filter pressure by open the air manual release valve before open the Lids since the filter has been pressurized during normal operation.



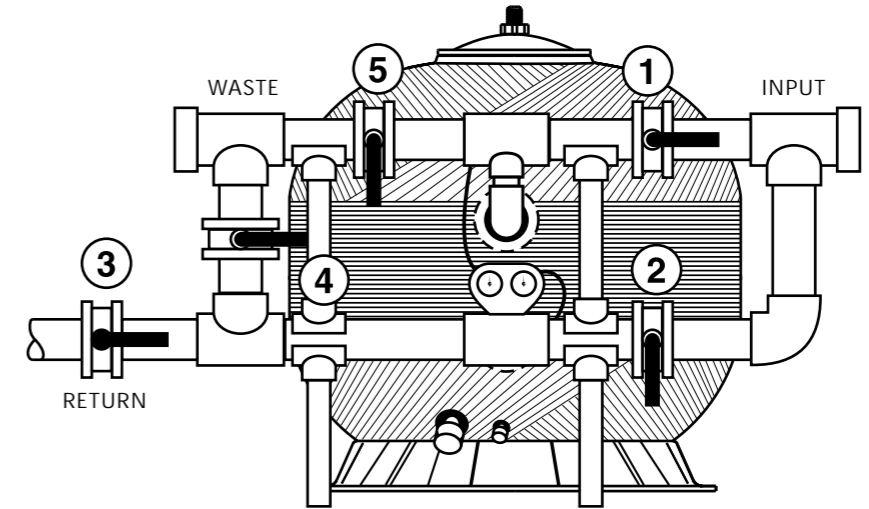
Introduce the lid in the manhole, leaving it leveled and centered. The lid must be supported by the handle, as this will avoid that it could fall into the tank and damage any of its parts.  
 Put the bridge in the position shown and manually tighten the wheel.  
 To achieve a proper seal, you do not have to manually tighten the wheel, as this could damage the lid. The pressure itself will improve the seal.  
 When the filter is under pressure, it is normal that wheel and bridge remain separated. You must not tighten the wheel again when the filter is under pressure, because when the pumps stop, the lid could be damaged or blocked.



Once the filter has been completely filled with water, start the performance of installation, venting manually to eliminate all the air that could be inside the filter, as the presence of air will affect the filter performance.  
 After this, the filter has been ready for working process.

### 3.3 MULTI-FUNCTION VALVE

There is 5 way butterfly valve design for horizontal filter which function same as a multi-port valve. The location of valves and their functions is listed below table.



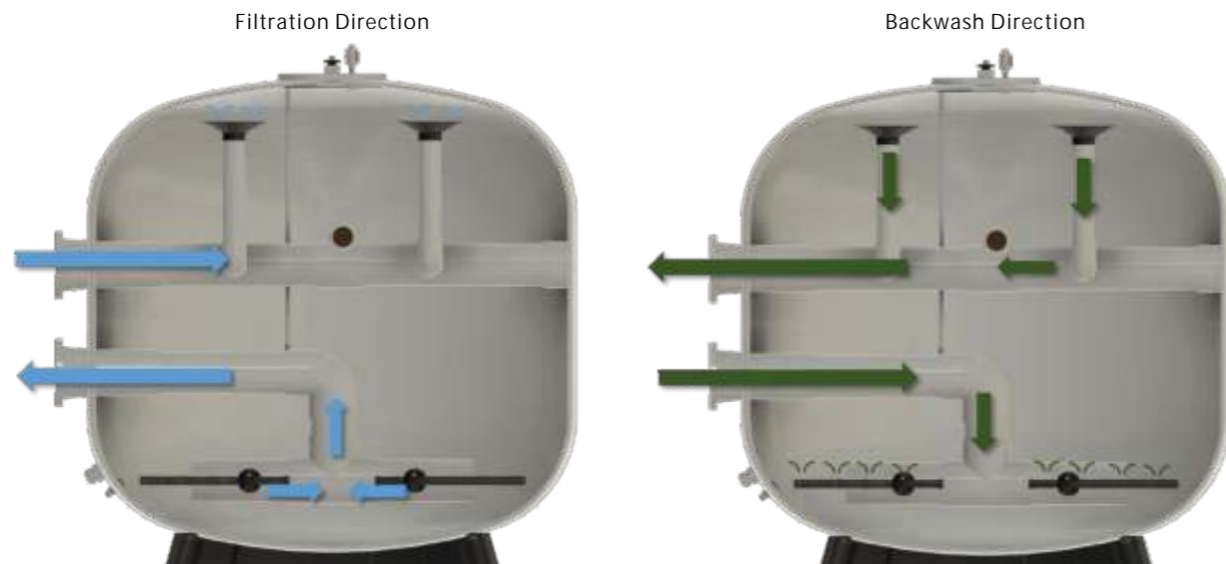
FILTER	open	close	open	close	close
BACKWASH	close	open	close	close	open
RINSE	open	close	close	open	close
WASTE	open	close	close	close	open
RECIRCULATE	close	open	open	close	close

#### FILTER

It is the normal position for filtering the body of water. The flow of water is directed to the inlet ports which, then distributes the influent water evenly through the top of the bored pipe over the filter media bed. The water travels evenly down through the filter media bed to the lateral filtered water collection system. The cleaned water travels up through the center pipe to the outlet

#### BACKWASH

It is the position for cleaning the filter media. When the differential pressure between the two manometers is 1 Kg/cm<sup>2</sup> or higher, backwash must be carried out.  
 The flow of water is flow in reverse of filtering to flush out the foreign matter or debris from the filter media bed. To achieve efficient removal of foreign matter or debris, the water is evenly distributed by the under laterals system up through the media bed, lifting and agitating the media to release the foreign matter or debris. The water flows through the non-closed ports of the valves manifold, directly to the backwash outlet.



## RINSE

It is for flushes clean the filter system. The flow of water is directed down through the filter media bed to the laterals system assembly. This process settles the filter media bed into place and flushes any remaining foreign matter or debris out of the filter to the drain line, before to place into filtration the valves manifold

## WASTE

It is to direct the water flow to waste bypassing the filter media bed. The flow of water is directed to the backwash outlet bypassing the filter media. This function may be used when it is necessary to lower the level of the body of water in the system.

## RE-CIRCULATE

This function will direct the flow of water to water facility (or swimming pool) without filtration.

## 4. START-UP

### 4.1 FILTER TESTING:

Even the filter has been tested for leakage before dispatch, it is a must to ensure there is no damage of the filter during transportation and installation.



1. It is necessary to check the internal lateral or nozzle arms and piping system to ensure they are in proper position and well fixed.
2. Then, fill the filters with water only unless water stream is discharged from the outlet vent without air. Close the discharge vent valve and run the system to check any leaks of the filter, piping and other equipment works properly. If problem is found, contact your local supplier immediately for assistance.
3. When it is confirmed there is no water leakage, stop the pump and open the air release valve on the top of the filter to release pressure.
4. It is important to divert the media off to the side of the tank during the loading process so that the media is not dumped directly onto the laterals.
5. Once the filter is full with the filtration media, clean the lid and the inner part of the manhole. This will prevent any debris and sand from affecting the sealing.

## 5. MAINTENANCE

The Filters are designed, fabricate, and tested without maintenance.

The filter media is only thing require to change if it has reached the limits of its designated lifespan.

In order to ensure the maximum life of the selected media are as follows.

1. Check the manometer pressure reading in a regular base and Backwash the filter if pressure rise to backwash level.
2. Maintain the water in good chemical balance, especially for Pool and SPA application purpose.
3. Keep all pre – filters equipment clean to maintain good water flow.
4. Replace pressure gauge if faulty readings are observed.
5. Maintain a regular maintenance program.

### 5.1 WINTERIZING



When temperature drop, water freezing can occur and damage the filter tank. It is necessary to drain the water from the filter tank prior to freezing conditions.

### 5.2 SAND MEDIA REPLACEMENT

To change sand media, proceed as follows:

1. Remove top lid
2. Drain filter's water through the lower drainage hole.
3. Sand should be removed through the manhole.
4. To refill the filter with sand, follow the instructions given in start-up, checking first of all that the drainage hole has been perfectly fitted and that it does not leak water.

If the equipment has been stopped during a long period of time, it is advisable to empty the water filter.

In standard filters, ozone water treatments must not be used and pressure and temperature specifications must not be exceeded. Contact our technical department if you have any doubt about the use of our filter.

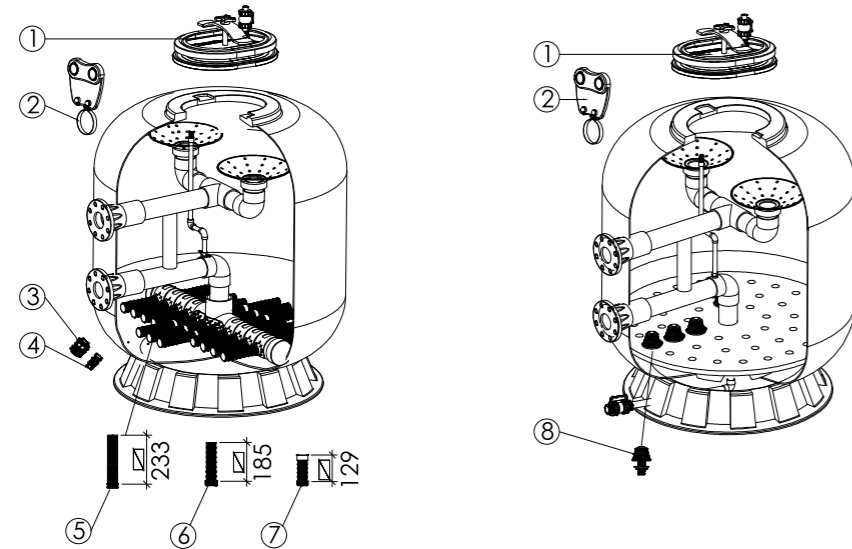
### 5.3 AFTER-SALES SERVICE

Refer all service needs to your local agent or dealer as his knowledge of your equipment makes him the best qualified source of information. Order all the repair parts through your dealer. Give the following information when ordering repair parts.

1. Unit name on the plate data or serial number on the label.
2. Description of the part.

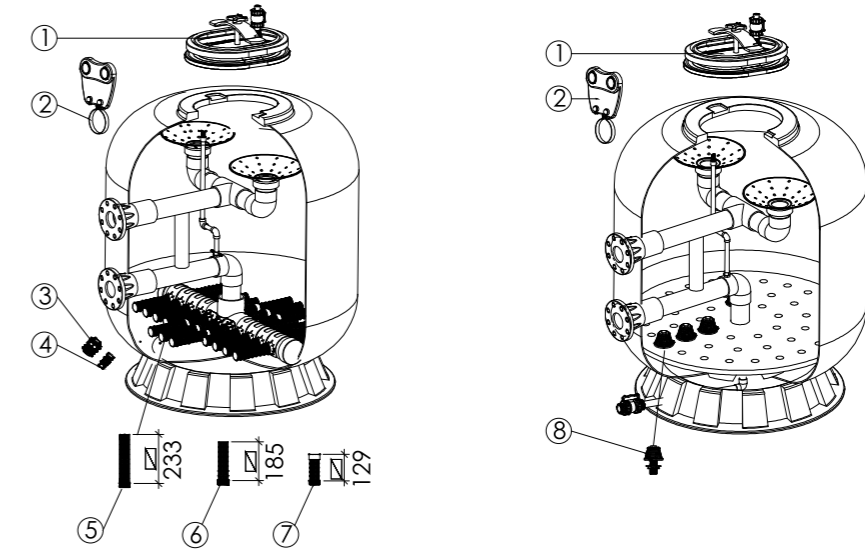
## 6. FILTER SERVICE PART LIST

### NL Series Nozzle and Lateral



Key No.	Part No.	Description	QTY
1	E012023	Lid with O-ring for NL/K (with Air Purge)	1
	E012087	Lid with O-ring for NL/K (new version with Air Purge)	
1	E012053	Lid with O-ring for NL/K/H (without Air Purge )	1
	E2012088	Lid with O-ring for NL/K/H (new version without Air Purge )	
2	4106191835	Manometer for Commercial Filter Dia. 1.2m	1
2	4106191836	Manometer for Commercial Filter Dia. 1.4m / 1.6m	1
2	4106196471	Manometer for Commercial Filter Dia. 1.8m / 2m	1
2	4106196472	Manometer for Commercial Filter Dia. 2.2m/ 2.3m / 2.5m	1
3	E012017	1.5" Sand Drain Set for NL1200-NL1600	1
3	E012004	2.0" Sand Drain Set for NL1800-NL2500	1
4	E010406	Water Drain Set	1
5	4107210676	Laterals (233mm)	1
6	4107210657	Laterals (185mm)	1
7	01172009	Laterals (129mm)	*
8	4107210656	0.4mm Nozzles	*
Notes:	NL1200 should have 185mm x 8pcs and 233mm x 8pcs and 129mm x 8pcs of laterals		
	NL1400 should have 185mm x 14pcs and 233mm x 8pcs and 129mm x 28pcs of laterals		
	NL1600 should have 185mm x 8pcs and 233mm x 12pcs and 129mm x 12pcs of laterals		
	NL1800 should have 185mm x 4pcs; 233mm x 28pcs of Laterals		
	NL2000 should have 185mm x 8pcs; 233mm x 32pcs; 129mm x 8pcs of Laterals		
	NL2300/2500 should have 185mm x 40pcs; 233mm x 16pcs; 129mm x 48pcs of Laterals		

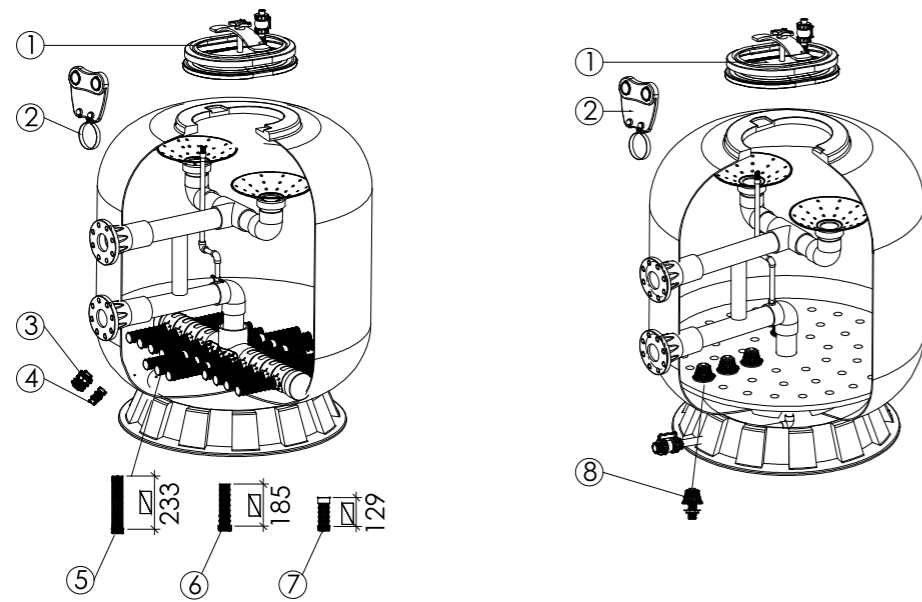
### K Series Lateral and Nozzle



Key No.	Part No.	Description	QTY
1	E012023	Lid with O-ring for NL/K (with Air Purge)	1
	E012087	Lid with O-ring for NL/K (new version with Air Purge)	
1	E012053	Lid with O-ring for NL/K/H (without Air Purge )	1
	E012088	Lid with O-ring for NL/K/H (new version without Air Purge )	
2	4106191835	Manometer for Commercial Filter Dia. 1m/ 1.2m	1
2	4106191836	Manometer for Commercial Filter Dia. 1.4m / 1.6m	1
2	4106196471	Manometer for Commercial Filter Dia. 1.8m / 2m	1
2	4106196472	Manometer for Commercial Filter Dia. 2.2m/ 2.3m / 2.5m	1
3	E012017	1.5" Sand Drain Set for K1200-K1600	1
3	E012004	2.0" Sand Drain Set for K1800-K2500	1
4	E010406	Water Drain Set	1
5	4107210676	Laterals (233mm)	*
6	4107210657	Laterals (185mm)	*
7	4107210656	Laterals (129mm)	*
8	E012061	0.4mm Nozzles	*
Notes:	K1200 should have 185mm x 8pcs and 233mm x 8pcs and 129mm x 8pcs of laterals		
	K1400 should have 185mm x 14pcs and 233mm x 8pcs and 129mm x 28pcs of laterals		
	K1600 should have 185mm x 8pcs and 233mm x 12pcs and 129mm x 12pcs of laterals		
	K1800 should have 185mm x 4pcs; 233mm x 28pcs of Laterals		
	K2000 should have 185mm x 8pcs; 233mm x 32pcs; 129mm x 8pcs of Laterals		
	K2300/2500 should have 185mm x 40pcs; 233mm x 16pcs; 129mm x 48pcs of Laterals		

E series Lateral and Nozzle

## E Series Lateral and Nozzle



Key No.	Part No.	Description	QTY
1	E011620	Lid with O-ring for E1050/E1200 (with Air Purge)	1
	E011629	Lid with O-ring for E1050/E1200 (without Air Purge )	
1	E012023	Lid with O-ring for E1400-E2200 (with Air Purge)	1
	E012087	Lid with O-ring for E1400-E2200 (new version with Air Purge)	
1	E012053	Lid with O-ring for E1400-E2200 (without Air Purge )	1
1	E012088	Lid with O-ring for E1400-E2200 (new version without Air Purge )	1
2	4106191835	Manometer for Commercial Filter Dia. 1m/ 1.2m	1
2	4106191836	Manometer for Commercial Filter Dia. 1.4m / 1.6m	1
2	4106196471	Manometer for Commercial Filter Dia. 1.8m / 2m	1
2	4106196472	Manometer for Commercial Filter Dia. 2.2m/ 2.3m / 2.5m	1
3	E012017	1.5" Sand Drain Set for E1050-E1600	1
3	E012004	2.0" Sand Drain Set for E1800-E2200	1
4	E010406	Water Drain Set	1
5	4107210676	Laterals (233mm)	*
6	4107210657	Laterals (185mm)	*
7	4107210656	Laterals (129mm)	*
8	E012061	0.4mm Nozzles	*
Notes:	E1050 should have 185mm x 18pcs of laterals		
	E1200 should have 185mm x 8pcs and 233mm x 8pcs and 129mm x 8pcs of laterals		
	E1400 should have 185mm x 14pcs and 233mm x 8pcs and 129mm x 28pcs of laterals		
	E1600 should have 185mm x 8pcs and 233mm x 12pcs and 129mm x 12pcs of laterals		
	E1800 should have 185mm x 4pcs; 233mm x 28pcs of Laterals		
	E2000 should have 185mm x 8pcs; 233mm x 32pcs; 129mm x 8pcs of Laterals		
	E2200should have 185mm x 16pcs; 233mm x 36pcs; 129mm x 32pcs of Laterals		