

InterSeptor Centrifugal Separators Operating & Maintenance Manual



General Information:

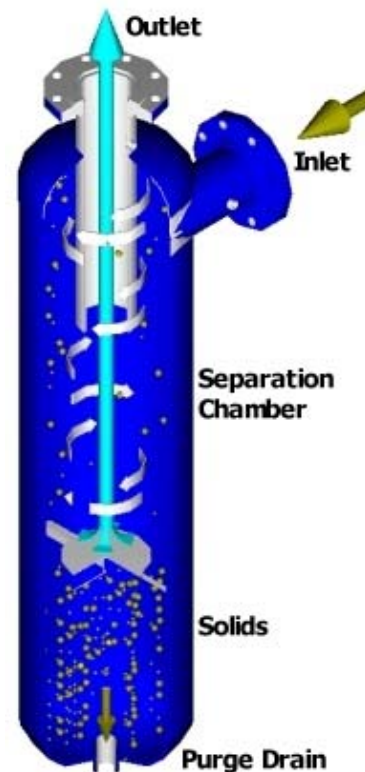
This manual was prepared to assist in the installation, operation, and maintenance of PEP ICS centrifugal separator systems. For immediate response to questions not covered in this manual please contact your PEP representative or call the factory at 800-24-FILTERS.

Description:

The PEP ICS Separator has no moving parts, requires no spare parts inventory, and contains no filter media to clean or change. The flow-through design allows for continuous operation while process liquid is pumped through the ICS separation chamber. The PEP ICS Separator is ideal for separating solids from cooling tower water, process water, and other applications requiring separation of liquids from solids. PEP InterSeptor Centrifugal Separator models are referred to by the inlet/outlet size. For example, the 1" model separator has one-inch inlet and outlet fittings; the 2" model separator has two-inch inlet and outlet fittings, and so forth.

Principle of Operation:

Liquid enters the ICS cylindrical separation chamber through a tangential entry port located near the ICS Separator top. The tangential entry port induces a spinning motion to the liquid / suspended particulate medium. The heavier than liquid particulates are forced to the outside of the cylindrical separation chamber wall, where they settle to the bottom of the separator and accumulate in what is referred to as the solids collection chamber. This chamber is purged periodically to remove the collected solids. The standard purge is a manual operation. A purge valve (not supplied) sized to match the drain must be installed before placing the ICS into operation. Automatic purging is available as a factory installed option. Clean water flows up the center vortex tube and exits the ICS Separator.



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Installation:

The following items are not included with Standard ICS units, but are required for operation:

- Inlet/outlet valves
- Spool pieces
- Air relief valve
- Pressure gauges

PEP InterSeptor Centrifugal Separators (ICS) can be installed in several different ways:

1. Free standing on integral base plate with anchor provision (on 3 inch units and smaller)
2. Leg assemblies with anchor provision (on 4" units and above)
3. Wall mounting (with optional wall mounting kit)
4. Special 45° angle for restrictive vertical space limitations

It is recommended to install a valve on the inlet and outlet of the ICS Separator in the event it becomes necessary to isolate the unit from the process. For ICS units 6" and larger, it is further recommended to install a spool piece between the valves and separator inlet and outlet. This will facilitate installation and removal of the separator from the process piping. The valves and spool pieces should be sized to match the ICS separator inlet and outlet diameters. For ease of installation, allow about three feet of clearance around the separator. Check for any applicable local, state and federal codes.

An adequate foundation or other support means must be provided for the ICS unit. Three inch and smaller separators are provided with an integral base mounting plate with holes to accommodate floor mounting. Separators larger than three inches have four legs with a provision for floor mounting. Check inlet, outlet and purge nozzles for any foreign objects that may have entered the ICS during shipment, storage or installation. When connecting inlet and outlet piping, use appropriate hardware to match inlet & outlet diameters. Flange bolts and gaskets are not included with separator. ICS separators are typically installed downstream of a pump system. To assure sufficient velocity for adequate liquid/solids separation, the inlet pressure should be in the range of 3 to 10 psig greater than the ICS discharge pressure.

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For adequate separator performance, the PEP ISC Separator system should be installed no more than 5 feet above or 8 feet below the sump, water basin, or tower water level.

Note: When the separator is installed above basin level, a check valve must be installed in the lowest point of the pump suction line (below water level).

Piping and Valves – The PEP ICS Separator inlet is located on the side, near the top. The separator outlet is located on the top. On 3" and smaller units, the purge connection is located on the side, near the bottom. On 4" and larger units, the purge connection is located on the bottom. The ½" and ¾" models have threaded npt

nipples for connection to the inlet and outlet. All larger models have 150 lb. Raised face flange connections.

The separator outlet piping should be plumbed to merge with the flow in the piping system, not against it. Pipe size must be the same as the inlet and outlet separator fittings to maintain proper flow. PEP will furnish typical installation drawings upon request.

Connecting the drain line: To assure proper collected solids drainage, it is important to match the drainpipe diameter with the diameter of the drain fitting on the ICS Separator. Refer to the dimension table on the drawing in this manual (Purge Outlet "B") for the drain size of your particular ICS Separator.

Maintenance / Purging:

The ICS Separator requires periodic purging. Otherwise, accumulation of separated solids will overfill the collection chamber and system performance will be diminished.

To assure sufficient purge pressure, there should be a minimum 5 psig at the separator outlet. Slope the purge line continuously downward to assure complete drainage. Three purge options are available:

1. Manual purge: A valve on the collection chamber is opened by hand periodically to purge solids from the chamber (standard on all ICS Separators).
2. Automatic purge: PEP offers a motorized ball valve that will automatically open the purge drain at a field selectable time interval. Once every 4 hours is typical. The purge duration is also field selectable. The ICS Separator is continuously on line, even during the purge cycle.

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3. Continuous purge: The purge line valve is open a small amount and water continuously purges the system to keep it clean.

Note: It is recommended to purge the unit while in operation. This assures a strong purge for best evacuation of the solids collection chamber.

Winter Operation: If exposed to freezing temperatures, the potential exists for the separator and related exposed piping to freeze. Damage to piping and separator may result. Continuous operation will minimize the freeze risk however, it is recommended to protect the piping and separator in some manner (locate indoors or apply heat tracing and insulation to exposed all surfaces). If the unit is idle for periods of time, it is recommended to drain the ICS Separator and pump.

Startup Procedure:

Before startup, always check the immediate area and remove any debris that may interfere with moving pump parts or cause possible injury to personnel.

If the unit is supplied with the optional system matched pump / pre-strainer combination, check the pre-strainer basket prior to every startup for large solids that may damage ~ pump or restrict it's flow.

With power turned off and locked out at the main circuit breaker, turn the pump shaft by hand to make sure that the impeller turns freely.

Check any isolation or service valves to make sure they are in the full open position so as not to restrict the suction or discharge.

Quickly turn the pump motor on and then off, taking note of the rotation of the pump shaft. Make sure the shaft is rotating in the direction required by the pump. If the motor rotates backward, have an electrician switch the phases and repeat this procedure.

Open the manual air relief valve on the top of the separator. Start the pump and allow the separator vessel to fill. Once the air is purged, close the valve.

Check the pump motor current draw to make sure it is not drawing more than the rated current. Refer to the motor nameplate for the current rating and voltage requirement.

Check the system piping and repair any leaks. Open the air vent again on top of the separator. If air is vented, it could be caused by a small leak in the pump inlet

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suction piping. Make sure the pre-strainer lid is securely fastened and the gasket is not pinched.

With liquid flowing through the separator, check and record the inlet and outlet pressure gauge readings. Also record the pressure differential. The pressure differential (psid) is the difference between the outlet and inlet pressure readings. For adequate separator performance, the pressure drop should be in the range of 3 to 10 psid.

Note: The separator size is determined by the flow rate through the separator. If the separator is too large for the flow, insufficient pressure differential will result and negatively affect separator performance.

The following table indicates recommended flow ranges for PEP InterSeptor Centrifugal Separators (ICS). Optimal pressure differential is realized when running the separator within the prescribed operating flow range.

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Model	Inlet/Outlet Diameter	Purge Outlet Diameter	Flow Range (gpm)
ICS2-0050	1/2"	1"	10 - 20
ICS2-0075	3/4"	1"	15 - 35
ICS2-0100	1"	1"	30 - 60
ICS2-0125	1-1/4"	1"	50 - 110
ICS2-0150	1-1/2"	1"	80 - 150
ICS2-0200	2"	1"	120 - 210
ICS2-0300	3"	1"	195 - 330
ICS2-0400	4"	1-1/2"	280 - 500
ICS2-0500	5"	1-1/2"	320 - 750
ICS2-0600	6"	1-1/2"	690 - 1350
ICS2-0800	8"	1-1/2"	1000 - 2225
ICS2-1000	10"	2"	1500 - 3500
ICS2-1200	12"	2"	2000 - 5000