



Graver's patented Powdex® condensate polishing system is a precoat filter demineralizer which provides both suspended solids removal and ion exchange capability in a single unit. The process utilizes powdered ion exchange resin in combination with fiber materials to form a precoat on specially designed filter septa. This Powdex® precoat provides excellent filtration performance and rapid ion exchange kinetics that can be optimized to meet changes or upsets in cycle chemistry. The Powdex system is chemical-free, uses ion exchange resin for a single use and subsequently disposed off without the temperature constraints of typical deep bed polishers. The result is the perfect system to ensure fast starts and long term steam cycle operation by meeting the effluent quality needed to satisfy the high demands of today's utility and industrial applications.

## Advantages of Condensate Polishing

- Elimination and control of harmful impurities, both dissolved and insoluble resulting in increased thermal efficiency, turbine protection from deposits and increased overall plant efficiency
- Quicker startups decrease the time necessary for the plant to achieve full generating capacity
- Extension of the boiler lifetime due to exposure to "cleaner" water
- Backup protection in the case of suspended solids or dissolved contamination from a condenser tube leak or rupture
- Decrease/elimination of blow-down resulting in decreased makeup water requirements and increased thermal efficiency
- Reduced maintenance on the turbine/boiler system from both a labor and cleaning chemical usage
- Reduced or elimination of blowdown during normal operation

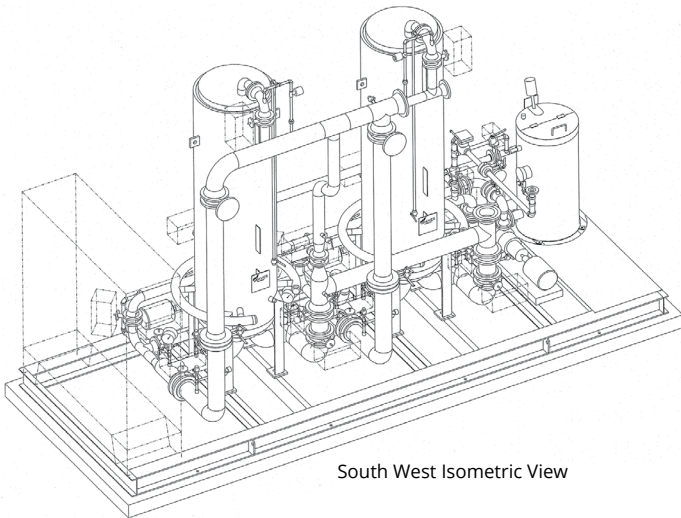
## Typical Applications:

- Used in power (nuclear and fossil): Condensate treatment, heat recovering steam generators, and combined cycle plants especially with air cooled condensers
- Used in petrochemical and chemical steam generation: Condensate treatment for industrial boilers

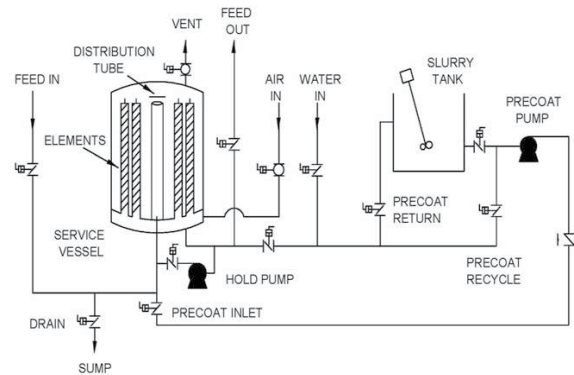
## Powdex Features

- Superior suspended solids and corrosion by-product removal
- Filtration and ion exchange in a single unit
- Elimination of chemical handling
- Reduced generation of wastewater
- Lower overall system cost (capital + operating)
- Smaller equipment footprint compared to deep bed + Filtration
- Low  $\Delta P$  (Pressure drop)
- Protection of steam loop assets such as Boiler, Turbine, Condenser, etc

# Powdex® Condensate Filter Demineralizer



South West Isometric View



Powdex Service Vessel			Nominal Pipe Size			Utilities				Dimensions - Ft.		Shipping Weights - lbs			Operating Weights - lbs		
Model No. Notes (1)	Nom. Diam. In.	Max Flow GPM	In/Outlet Size In.	Vent Size In.	Drain Outlet In. -3	B/W Water GPM -5	Waste Vol. Gal.	B/W Air Makeup SCFM -6	Total Air SCF	Filter Module (ea) LxWxClear -7	Precoat Module LxWxClear	Filter Module Each	Precoat Module	Air Surge Tank	Filter Module Ea.	Precoat Module	Air Surge Tank
GP-24-0238-X-C-3	24	428	4	2	3	27	600	43	34	19'-0"x7'-3"x16'-7"	included	20,000	incl.	1,500	26,000	incl.	1,500
GP-30-0378-X-C-3	30	660	6	2.5	3	42	1000	66	527	20'-0"x7'-3"x17'-0"	included	21,000	incl.	2,000	34,500	incl.	2,000
GP-36-0546-X-C-3	36	951	8	2.5	4	59	1300	95	761	21'-0"x7'-6"x17'-6"	included	22,000	incl.	2,500	40,000	incl.	2,500
GP-42-0882-X-C-3	42	1536	8	3	6	96	2000	154	1229	13'-0"x9'-0"x17'-9"	included	18,000	incl.	3,000	35,000	incl.	3,000
GP-48-1176-X-C-3	48	2048	10	3	6	128	2700	205	1638	13'-6"x9'-0"x18'-0"	included	19,000	incl.	4,000	40,000	incl.	4,000
GP-54-1582-X-C-3	54	2755	10	4	6	172	3500	275	2204	14'-0"x9'-0"x18'-3"	included	20,000	incl.	5,000	45,000	incl.	5,000
GP-60-2002-X-C-3	60	3486	12	4	8	218	4500	349	2789	8'-9"x7'-6"x18'-5"	7'-6"x7'-0"x13'-1"	22,000	6,000	6,000	40,000	8,500	6,000
GP-66-2436-X-C-3	66	4242	12	4	8	265	5500	424	3394	11'-0"x9'-9"x18'-8"	10'-0"x9'-0"x13'-1"	24,000	11,000	7,500	38,000	19,000	7,500
GP-72-2940-X-C-3	72	5120	12	6	10	320	6600	512	4096	11'-6"x10'-0"x18'-10"	10'-6"x9'-0"x13'-1"	27,000	11,200	9,500	45,000	20,000	9,500
GP-78-3444-X-C-3	78	5998	14	6	10	375	7800	600	4798	12'-0"x11'-5"x19'-7"	11'-0"x9'-6"x13'-1"	30,500	11,500	10,000	53,000	21,500	10,000
GP-84-4032-X-C-3	84	7022	16	8	10	439	8900	704	5616	14'-0"x12'-6"x20'-0"	13'-6"x11'-6"x13'-1"	50,000	17,000	12,500	87,000	33,000	12,500

Notes:

- (1) For X digit substitute N=nylon, P=polypropylene, M=316SS; for C digit substitute design pressure in psig.
- (2) Average design flow rate is typically 75% of maximum but can be restricted to 50% for high loading rates.
- (3) Drain pipe size represents discharge pipe size to customers open gravity drain.
- (4) One hold pump per Powdex vessel.
- (5) Backwash water required at 25 psi. Rates based on air surge type backwash for 238 ft2 units and larger.
- (6) Air surge makeup rate based on one minute recovery time. Divide by recovery time to obtain required rate at 80 psi.
- (7) Overhead clearance includes provision for element replacement.

## Contact Us

**Graver Water Systems, LLC**  
 30 Technology Drive Suite 2F  
 Warren, NJ 07059

T: 908 516 1400  
 F: 908 516 1401  
 E: sales@graver.com