



**Culligan®
Pro Series
Deionization
Systems**

assisted living facilities

cafeterias

casinos

corporate campuses

educational facilities

food service

grocery

hotel/hospitality

institutions

laundry

theme parks

vehicle wash



Pro Series Deionization Systems

Culligan Pro Series Automatic Deionizer Standard Features

- Two Bed Strong Base and Two Bed Weak Base Systems are available.
- All Plastic Construction– Filament wound epoxy coated fiberglass tanks to retain good appearance in harsh environments. Schedule 80 PVC plumbing and Noryl-bodied diaphragm valves resist corrosion.
- Transparent Backwash Piping– Allows the operator to observe flow to drain during backwash. Helps prevent loss of costly resin.
- Reliable Control Panel– Initiates regeneration automatically or by operator control when system becomes exhausted.
- Quality Rinse Feature– The rinse valve opens for a fast flush when the effluent resistivity is below desired set point. If the quality returns, the unit stays on-line. If the quality remains low, the unit shuts down for regeneration.



The Culligan Pro Series Deionization Systems

Applications and Benefits

- Manufacturing—Improved productivity for process, makeup and rinse.
- Boilers/Humidification—Reduced scaling, improved energy efficiency.
- Food and Beverage—Improved taste and clarity, low sodium.
- Plating—Spot-free rinse.
- Ice Production—Improved clarity and reduced mineral build-up.
- Printing—Consistent quality for fountain solution.
- Glass/Mirrors—Rinsing to improve quality and product yield.

Options

- Recirculation kits.
- Vacuum breakers.

System Specifications

Pressure: 50–100 psi
345–690 kPa

Power: 120V/60Hz/1.5 Amps

Temperature: 45–100°F
7 - 38°C

Enclosure Rating: NEMA 4x

	Model	Resin Volume ft ³			Pipe Size (in)	System Service Flow Rate*			
		Cation	Anion			Min.		Nominal	
			SB	WB		GPM Flow	psi Drop	GPM Flow	psi Drop
Two-Bed/ Strong Base	PS-20	5	6	–	1.0	4	3	20	23
	PS-24	9	10	–	1.5	6	4	30	15
	PS-30	14	16	–	1.5	10	4	50	22
	PS-36	21	23	–	2.0	14	2	70	22
	PS-42	26	29	–	2.5	19	2	100	17
Two-Bed/ Weak Base	PW-20	6	–	5	1.0	4	3	20	23
	PW-24	10	–	8	1.5	6	4	30	15
	PW-30	16	–	13	1.5	10	4	50	22
	PW-36	23	–	19	2.0	14	2	70	22
	PW-42	29	–	24	2.5	19	2	100	17

* Flow rates shown are per system. Duplex Alternating systems are also available.

“Hey Culligan Man!”

Culligan

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MOORE PART NO. 46960



NOTES: This product produces high-quality water which can be contaminated by or corrode the plumbing system following the unit. The purchaser is responsible to supply system components of inert material that are compatible with the application. Operational, maintenance and replacement requirements are essential for this product to perform as advertised.

The contaminants or other substances removed or reduced by this water treatment device are not necessarily in your water.

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PRO™ SERIES

ECONOMICAL AUTOMATIC INDUSTRIAL DEIONIZERS

SPECIFICATIONS AND OPERATING DATA

TWO-BED STRONG-BASE UNITS (SB)

MODEL NUMBER		PS-20	PS-24	PS-30	PS-36	PS-42
Capacity	gr	107,000	180,000	285,000	410,000	520,000
	g	6,900	11,700	18,500	26,600	33,700
Service Flow Rate (min-max)	gpm	4-20	6-30	10-50	15-70	20-100
	L/min	15-76	23-114	38-189	57-265	76-378
Δ P @ Maximum Service Flow Rate	psi	23	15	22	22	17
	kPa	159	103	152	152	117
Tank Size	in	20 x 62	24 x 71	30 x 72	36 x 72	42 x 72
	mm	510 x 1,575	610 x 1,800	760 x 1,829	910 x 1,829	1,070 x 1,829
Pipe Size	in	1	1.5	1.5	2	2.5
Resin Qty.:	Cation ft ³	5	9	14	21	26
	L	142	255	396	595	736
	Anion ft ³	6	10	16	23	29
	L	170	283	453	651	821
Chemical Dosage:	HCl gal	10	18	28	42	52
	20° Be L	38	68	106	160	197
	NaOH gal	6	9	15	22	27
	50% L	23	34	57	83	102
Approximate Shipping Weight	lb	1,000	1,550	2,200	3,000	4,200
	kg	454	703	998	1,361	1,905

TWO-BED WEAK-BASE UNITS (WB)

MODEL NUMBER		PW-20	PW-24	PW-30	PW-36	PW-42
Capacity	gr	126,000	210,000	335,000	480,000	605,000
	g	8,200	13,600	21,700	31,100	39,200
Service Flow Rate (min-max)	gpm	4-20	6-30	10-50	15-70	20-100
	L/min	15-76	23-114	38-189	57-265	76-378
Δ P @ Maximum Service Flow Rate	psi	23	15	22	22	17
	kPa	159	103	152	152	117
Tank Size	in	20 x 62	24 x 71	30 x 72	36 x 72	42 x 72
	mm	510 x 1,575	610 x 1,800	760 x 1,829	910 x 1,829	1,070 x 1,829
Pipe Size	in	1	1.5	1.5	2	2.5
Resin Qty.:	Cation ft ³	6	10	16	23	29
	L	170	283	453	651	821
	Anion ft ³	5	8	13	19	24
	L	142	227	368	538	680
Chemical Dosage:	HCl gal	12	20	32	46	58
	20° Be L	45	76	121	174	220
	NaOH gal	3	5	8	12	15
	50% L	11	19	30	45	57
Approximate Shipping Weight	lb	1,000	1,550	2,200	3,000	4,200
	kg	454	703	998	1,361	1,905

1. Capacities based on influent water having not more than 10 gpg (171 mg/L) total dissolved ionizable solids as CaCO₃ at 25°C, free of color, oil, turbidity and organics. A complete water analysis is necessary to accurately predict deionized water quality and capacity for a specific application.

2. Capacities based on using Culligan high performance cation resin, high purity strong base anion resin and weak base anion resin. Other resins are available. The capacity may vary.

3. Capacities and gallons of chemical based on regenerating cation resin at 6 lb per ft³ (96 g/L) as 100% HCl strong base anion resin with at 6 lb per ft³ (96 g/L) as 100% NaOH, or weak base anion resin at 4 lb per ft³ (64 g/L) as 100% NaOH.

OPERATING DATA

Electrical	120V/60 Hz/1.5 Amp Max.	
Temperature	SB Models	40° - 100°F (4° - 38°C)
	WB Models	40° - 120°F (4° - 49°C)
Pressure	40 - 100 psi (276 - 690 kPa)	

Culligan

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LIMITED WARRANTY

SERIES "F" WATER CONDITIONERS

You have just purchased one of the finest water conditioners made. As an expression of our confidence in Culligan products, your water conditioner is warranted to the original end-user, when installed in accordance with Culligan International Company specifications, against defects in material and workmanship from the date of original installation, as follows:

For a period of ONE YEAR

The entire conditioner, but excluding replacement chemicals and expendable replacement cartridges if used.

If a part described above becomes defective, within the specified period, you should notify your independently operated Culligan dealer and arrange a time during normal business hours for the dealer to inspect the water conditioner on your premises. Any part found defective within the terms of this warranty will be repaired or replaced by the dealer. You pay only freight from our factory and local dealer charges.

Of course, damage caused by accident, fire, flood, freezing, Act of God, misuse, misapplication, neglect, alteration, installation or operation contrary to our printed instructions, or by the use of accessories or components which do not meet Culligan specifications, is not covered by this warranty.

Our product performance specifications are furnished with each water conditioning unit. TO THE EXTENT PERMITTED BY LAW, CULLIGAN DISCLAIMS ALL IMPLIED WARRANTIES, INCLUDING WITHOUT LIMITATION WARRANTIES OF MERCHANTABILITY AND FITNESS FOR PARTICULAR PURPOSE; TO THE EXTENT REQUIRED BY LAW, ANY SUCH IMPLIED WARRANTIES ARE LIMITED IN DURATION TO THE ONE-YEAR PERIOD SPECIFIED ABOVE FOR THE PARTS DESCRIBED IN THIS LIMITED WARRANTY. As a manufacturer, we do not know the characteristics of your water supply or the purpose for which you are purchasing a water conditioner. Please understand that the quality of water supplies may vary seasonally or over a period of time, and that your water usage rate may vary as well. Water characteristics can also change considerably if your water conditioner is moved to a new location. For these reasons, we assume no liability for the determination of the proper equipment necessary to meet your requirements, and we do not authorize others to assume such obligations for us. Further, we assume no liability and extend no warranties, express or implied, for the use of this product with a non-potable water source. OUR OBLIGATIONS UNDER THIS WARRANTY ARE LIMITED TO THE REPAIR OR REPLACEMENT OF THE FAILED PARTS OF THE WATER CONDITIONER, AND WE ASSUME NO LIABILITY WHATSOEVER FOR DIRECT, INCIDENTAL, CONSEQUENTIAL, SPECIAL, GENERAL, OR OTHER DAMAGES, WHETHER FROM CORROSION OR OTHER CAUSES.

CONSUMERS:

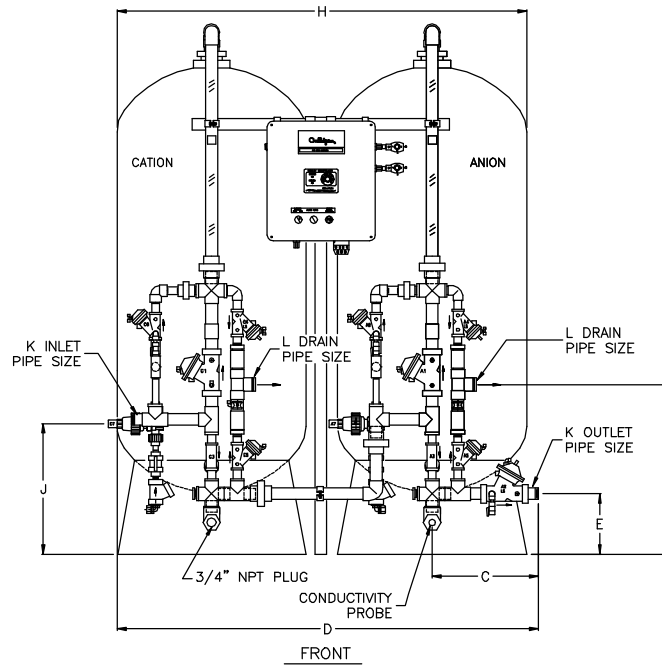
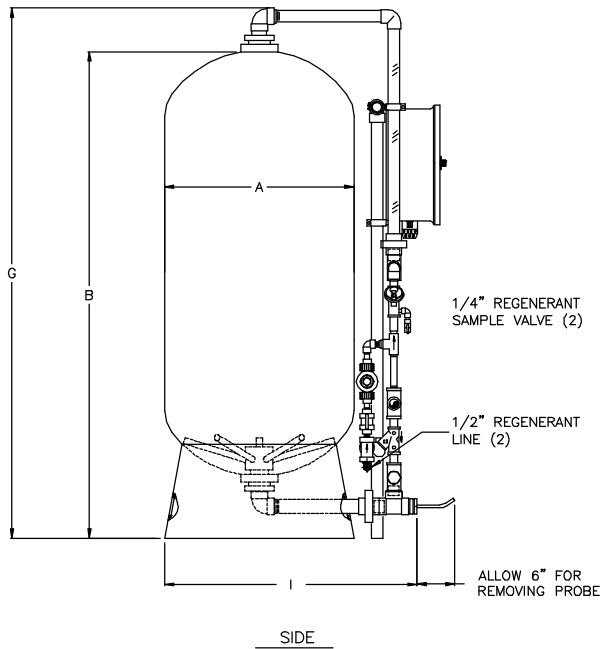
Some states do not allow limitations on how long an implied warranty lasts, so the above limitation may not apply to you. Similarly, some states do not allow the exclusion of incidental or consequential damages, so the above limitation or exclusion may not apply to you. This warranty gives you specific legal rights, and you may also have other rights which vary from state to state. Consult your telephone directory for your local independently-operated Culligan dealer, or write Culligan International Company for warranty and service information.

**CULLIGAN INTERNATIONAL COMPANY
One Culligan Parkway
Northbrook, Illinois 60062**

NOTES:

- (1) ALLOW A 30" SPACE ALONG THE SIDE OF EACH UNIT FOR ACID AND CAUSTIC CHEMICAL CONTAINERS.
 - (2) ALL DIMENSIONS SHOWN IN INCHES ARE ROUNDED OFF TO THE NEAREST SIGNIFICANT FIGURE.
 - (3) ALLOW 24" ABOVE UNIT FOR RESIN FILLING.
 - (4) THIS SYSTEM USES FRP TANKS WHICH MUST NOT BE SUBJECTED TO VACUUM. OPTIONAL VACUUM BREAKERS ARE AVAILABLE AND SHOULD BE INSTALLED ON TANK OUTLETS.
 - (5) ALL DIMENSIONS ARE ± 1 INCH (25mm) AND SUBJECT TO CHANGE WITHOUT NOTICE.
- * DO NOT MAKE A DIRECT CONNECTION TO THE DRAIN. PROVIDE AN AIR GAP OF AT LEAST FOUR TIMES THE DIAMETER OF THE DRAIN PIPE TO CONFORM TO SANITATION CODES AND TO PERMIT THE OBSERVATION OF THE DRAIN FLOW. DO NOT INSTALL A VALVE IN DRAIN LINE OR USE PIPE SMALLER THAN LISTED IN TABLE.

MODEL	DIMENSIONS (INCHES)												DRAIN FLOW		MINIMUM DRAIN SIZE	OPER. WT.
	A	B	C	D	E	F	G	H	I	J	K	L	CATION /	ANION		
PS/PW-20	20	60	13	49	9	26	76	46	32	20	1	1	10	3	1	1800 lb.
PS/PW-24	24	72	20	62	9	26	85	54	34	21	1.5	1.5	15	5	1.5	2550 lb.
PS/PW-30	30	72	20	68	10	28	87	66	40	22	1.5	1.5	20	8	1.5	3930 lb.
PS/PW-36	36	72	20	76	11	32	87	78	52	27	2	1.5	30	15	1.5	5660 lb.
PS/PW-42	42	72	25	88	18	40	95	90	58	36	2.5	1.5	48	20	1.5	7000 lb.



				Culligan® NORTHBROOK, ILLINOIS			
SCALE	00.00	DETAILED BY	KMR	CHECKED BY		APPROVED	
REF. NO.		DATE	3/10/99	DATE		DATE	
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PRINT & BILL OF MATERIALS ARE NOT TO BE USED WITHOUT THE WRITTEN CONSENT OF CULLIGAN USA DO NOT SCALE FROM DRAWING						PRO-SERIES AUTOMATIC DEIONIZER TECHNICAL DATA SHEET	
						DI_PRO SHEET 1 OF 1	



ENGINEER'S SPECIFICATION

AUTOMATIC DEIONIZER PRO™ SERIES	CUSTOMER:
	DATE:

1.0 SCOPE

1.1 Provide as indicated a vertical pressure type deionization system complete with pressure vessels, deionizing resin, control valve and controller. The system will be of an approved design as fabricated by a manufacturer regularly engaged in the production of water treatment equipment. All equipment and material will be supplied in compliance with the specifications as intended for a complete and operational system.

(Open Bidding Arrangement)

1.2 Qualified manufacturers of water treatment equipment of the type specified are Culligan International Company or the Engineer's approved equal.

(Closed Bidding Arrangement)

1.2 Qualified manufacturers of deionization equipment must be engaged in the manufacture of this equipment for a period of not less than fifteen (15) years. Acceptable manufacturers are Culligan International Company or the Engineer's approved equal.

2.0 GENERAL DESCRIPTION

(Selection for statement of specific model)

2.1 The system specifications are based on Culligan International model _____.

The purpose of the Culligan International PRO™ Series automatic deionizer will be to reduce the total dissolved solids from a known water supply so that the specific resistance of the water is not less than _____ K ohm-cm, when the system is operated at _____ gpm and in accordance with the operating instructions. The system will be capable of supplying _____ gallons of deionized water between regenerations based on the influent water analysis listed in Section 3.1 of this equipment specification.

The systems performance is rated at a design flow rate of _____ gpm with a rated pressure drop of _____ psi, and will be capable of a peak flow rate of _____ gpm for sustained periods of _____ minutes with a pressure drop of _____ psi.

There shall be a quantity of _____ of the above described systems.

(Selection for general statement)

2.1 The system, in compliance with the equipment specification, is described as an automatic _____ deionization system meeting the performance and design data requirements as hereinafter specified.

3.0 PERFORMANCE AND DESIGN DATA

3.1 INFLUENT WATER ANALYSIS

Calcium, Ca: _____	Chloride, Cl: _____
Magnesium, Mg: _____	Nitrate, N: _____
Sodium, Na: _____	Sulfate, SO ₄ : _____
Potassium, K: _____	Bicarbonate, HCO ₃ : _____
Strontium, Sr: _____	Carbonate, CO ₃ : _____
Barium, Ba: _____	Fluoride, F: _____

(Constituents above are expressed in ppm or mg/l as CaCO₃ or as otherwise specified.)

Silica, SiO ₂ : _____	TOC (Total Organic Carbon): _____
Iron, Fe: _____	Total Dissolved Solids, TDS: _____
Manganese, Mn: _____	

(Constituents above are expressed in ppm or mg/l.)

Turbidity, NTU: _____ Color: _____ pH: _____

3.2 DESIGN PARAMETERS

Normal System Flow & Pressure Drop: _____ gpm @ _____ PSI
Cation Backwash Flow: _____ gpm
Anion Backwash Flow: _____ gpm
Total Backwash Volume: _____ gallons nominal
Daily Water Usage: _____ gallons per day (gpd)
Daily Hours of Water Demand: _____
Operating Temperature Range: 45°–105°F
Operating Pressure Range (System): 10–75 PSI
Electrical Requirements: 120 Volt, 60 Hz, 1 phase
System Dimension (L x W x H): _____"L x _____"W x _____"H

3.3 EFFLUENT WATER QUALITY _____ MG/L TDS as CaCO₃
_____ K OHM/CM

4.0 EQUIPMENT SPECIFICATIONS

4.1 DEIONIZER TANKS

Each system shall include _____ tank(s). Each deionizer tank shall be _____ inches in diameter. The sideshell height shall be _____ inches, sufficient to allow proper freeboard space above the resin beds for adequate expansion of the resins during backwashing.

4.1.0 Tank Construction

Tank(s) shall be manufactured of polyester reinforced by a continuous roving glass filament overwrap and an "Iso-Gel" interior. The top and bottom opening will be 6"-8 UN threaded and the tank bottom will be supported on a molded structural base.

4.2 INTERNAL DISTRIBUTION

4.2.1 The upper distribution system shall be of the single point diffuser design to dispense water laterally to avoid channeling within the resin bed.

4.2.2 The lower distribution system shall be of the hub and radial arm type, constructed of PVC pipe. The hub radial and individual distributors shall be arranged for even flow distribution through the resin bed. No distributor slots will face upwards to minimize the opportunity for channeling.

4.3 OPERATING VALVE NEST

The operating valves shall be designed into a fully automatic individual diaphragm valve nest sized with **<1.0/1.5/2.0/2.5>** inch inlet and outlet connections. The valve nest design shall incorporate all valves necessary for complete control of the deionizer service and regeneration steps.

The diaphragm valves shall be slow opening and closing, free of water hammer. The valves shall be of the y-pattern, diaphragm design with large seat opening and high lift disc to permit high flow rates at minimum pressure drops. Positive control of the valve shall be achieved hydraulically without the aid of springs. Some valve will have adjustable limit stops. The valves shall be serviceable while in line.

4.4 PIPE AND FITTINGS

The main operating valve and manifold piping shall be factory assembled and shipped attached to the resin tank for ease of installation and start up. Piping and fittings shall be Schedule 80 PVC socket welded construction.

The piping assembly will include a section of clear piping to permit visual inspection of the backwash water.

All system inlet, outlet and drain connections shall be less than 50" in distance from the deionizer support level to provide ease of installation and service.

4.5 FLOW CONTROL

The backwash flow controllers shall be a pressure compensating orifice capable of providing and maintaining proper backwash flows over the entire listed operating pressure range of the system. The backwash flow controller shall be easily serviced without special tools and design so that service to the flow controller can be performed without disassembly of the valve body or the sequencing controller and without disconnecting existing inlet and outlet piping connections.

4.6 CONTROLS

The deionizer will be operated by an electro-hydraulic control system housed in a corrosion resistant NEMA 4X fiberglass enclosure. A cycle timer will be set by the manufacturer.

The cycle timer shall sequence all steps of an automatic regeneration and automatically return the deionizer to a service mode. The initiating quality set points shall automatically reset upon initiation of the regeneration sequence.

The control cycle will be programmed for sequential regeneration of cation and anion resins and will include a quality water rinse cycle. The front of the electrical panel will include the following controls:

- Lighted ON-OFF switch for visual indication of power onto the panel.
- Two-position mode switch to select manual or automatic initiation of the regeneration cycle
- Resistivity monitor with a range of 3,500 to 500,000 ohm-cm. It will include a field adjustable set point for initiating regeneration or signaling that the water quality is below the set point. The monitor will have green and red indicator lights to show whether the effluent water quality is above or below the set point.

4.6.1 System control options

(*Single Unit*)

An operator selected program of a quality-initiated regeneration for single units shall be available. The controller shall be capable of being entirely programmed in the field without additional interface devices.

(*Alternating Twin Unit*)

An operator selected program of immediate quality initiated regeneration for alternating twin configurations shall be available. The controller shall be capable of being programmed in the field without additional interface devices. The alternating function must be contained in the sequencing controller and each controller must communicate via a single pre-wired cable assembly, simultaneous regenerations shall not be possible.

4.7 EXCHANGE RESIN

The cation exchange resin shall be virgin high capacity "standard mesh" of sulfonated polystyrene type stable over the entire pH range with good resistance to bead fracture from attrition or osmotic shock. Each cubic foot of cation resin will be capable of removing 20,000 grains as calcium carbonate when regenerated with 6 lbs. of HCl.

The anion exchange resin shall be a

strongly basic gel (*strong base units*)

macroporous weak base (*weak base units*)

type based on a styrene divinylbenzene matrix stable over the entire pH range with good resistance to bead fracture from attrition or osmotic shock. Each cubic foot of anion resin will be capable of removing **<22,500/25,000>** grains as calcium carbonate when regenerated with **<6.0/4.0>** lbs of NaOH.

All resins shall be solid, of the proper particle size, and will contain no agglomerates, shells, plates or other shapes that might interfere with the normal function of the deionizer. The resins shall be manufactured to comply with the food additive regulation 21 CFR 173.25 as set forth by the USFDA.

The system shall include _____ cubic feet of cation exchange resin and _____ cubic feet of

strong base

weak base

anion exchange resin for a total of _____ cubic feet of resin for the system.

4.8 ACCESSORIES

(All Optional selections)

4.8.1 Vacuum Breaker for protecting Fiberglass tanks from vacuum.

4.8.2 A recirculation kit can be provided for the purpose of maintaining high quality water within the resin bed during periods of low use. The recirculation system will include a pump with sufficient capacity to recirculate water through the bed at not less than 2 gpm/ft². The system will include an isolation valve, check valve, and diaphragm shut-off valve.

5.0 INSTRUCTIONS

_____ complete sets of installation, operating and maintenance manuals shall be provided.

6.0 FIELD SERVICE

The services of a factory authorized service representative can be made available to supervise, inspect and provide operator training as required for initial start-up and system operation. Contact your local Culligan dealer for service rates and scheduling.

7.0 WARRANTY

A single written warranty must be provided from the manufacturer of the deionization system covering workmanship and materials.