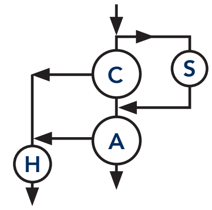
DEIONIZATION SYSTEMS INFORMATION

ifm WATER CYCLE TECHNOLOGIES

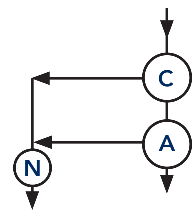
Because of varying conditions, information is to be used as a guideline only.

SIMULTANEOUS VS SEQUENTIAL SYSTEMS

Simultaneous – Both the cation and anion vessels will regenerate at the same time. It is not uncommon to blend the wastewater from the two in order to neutralize the stream and reduce the size and expense of the neutralization system. A source of softened water must be provided for the regeneration of the anion bed, as hardness will tend to precipitate and foul the media.



Sequential – The cation bed regenerates first in this configuration and supplies decationized water to the anion bed for regeneration. A separate source of soft water is not needed; however, the waste stream will require some consideration. In most applications, the low pH waste from the cation bed as well as the high pH waste from the anion bed will both need neutralization in order to be fed straight to the drain. The use of a storage tank with a chemical neutralization system is recommended.



INFLUENT WATER LIMITS

To achieve long resin and equipment life and deliver the highest quality of water obtainable from deionizers, the following limits are specified:

Temperature – 45°F – 105°F (7°C – 40°C) cold water tends to inhibit ion exchange and high temperature degrades the anion resin.

Pressure – 40 psi minimum to ensure proper eduction of regenerants.

Water Quality Limits without Pretreatment

TDS	35 gpg (600ppm)
Hydrogen Sulfide	0.01 ppm
Manganese	5.0 ppm
Organics-COD	1.0 ppm
Oil	0 ppm
Free Chlorine	0.2 ppm
Iron	1.0 ppm
Turbidity	5 JTU
Color	5 units

If any of the above substances are present and exceed the suggested parameters, pretreatment for their removal or reduction prior to deionization is recommended.

TYPICAL

DEIONIZATION SYSTEMS	APPLICATION	TYPICAL	LIMITATIONS
SAC WBA	Silica and CO2 are Not Objectionable	Conductance: 10-40 µS/cm Silica: Unchanged	Low Equipment Costs Low Anion Regenerant Costs
SAC SBA	Lower Alkalinity Raw Water, Silica and CO2 Removal Required	Conductance: 10-40 µS/cm Silica: removal	Low Equipment Costs Medium Regenerant Costs
SAC D SBA	High Alkalinity Water, Silica and CO2 Removal Required	Conductance: 10-40 µS/cm Silica: removal	Low Anion Regenerant Costs Repumping Required
SAC D WBA SBA	High Alkalinity Chloride and Sulfate Raw Water, Silica and CO2 Removal Required	Conductance: 10-40 µS/cm Silica: removal	Higher Equipment Cost Lowest Regenerant Cost Repumping Required
WAC SAC D WBA SBA	High Hardness Alkalinity, Chloride & Sulfate Raw Water, Silica & CO2Removal Required	Conductance: 10-40 µS/cm Silica: removal	Higher Equipment Cost Lowest Regenerant Cost Repumping Required
CF D SBA	High Sodium Raw Water, Low Leakage Required	Conductance: 10-40 µS/cm Silica: removal	Medium Equipment Cost Lower Acid Cost for Leakage Obtained
SAC SBA SAC	High Sodium Raw Water, Existing 2-Bed System Low Leakage Required	Conductance: 10-40 µS/cm Silica: removal	Easy To Retrofit System Danger of Acidic Water on Anion Breakthrough
MB	Low Solids Raw Water, High Purity Required	Conductance: 1-10 µS/cm Silica: removal	Low Equipment Costs High Chemical Costs Higher Attention Required
SBA SAC MB	Low Solids Raw Water, High Purity Required	Conductance: 0.06-1 µS/cm Silica: removal	Medium Equipment Costs High Chemical Costs Higher Attention Required

D – Degasifier

CF – Counter Flow Cation

MB – Mixed Bed

SAC – Strong Acid Cation Exchanger

SBA – Strong Base Anion Exchanger

WAC – Weak Acid Cation Exchanger

WBA – Weak Base Anion Exchanger