

LEACHATE TREATMENT WITH WEHRLE DIRECT RO

Purpose

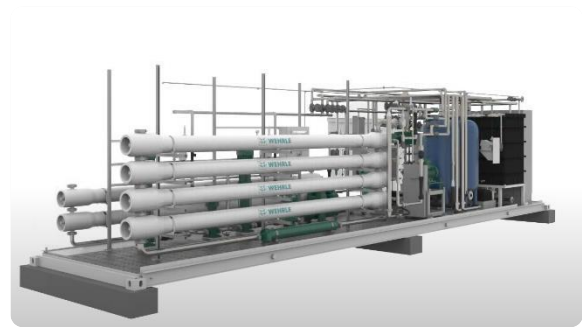
WEHRLE Direct-RO Reverse Osmosis systems separate leachate into a concentrate containing organic substances (BOD, COD), nitrogen compounds (ammonia, organic combined nitrogen), PFC/PFAS, heavy metals and salts – and a high quality, low-saline permeate.

The Direct-RO operates with **spiral wound** (SW)

organic membranes in a **Feed & Bleed** configuration at **80 bar**. SW membranes are globally produced in high quantities and offer a good price/performance ratio, also for replacements.

The membranes work with large spacers that have been especially developed for use with difficult effluents to optimize availability and reduce clogging.

Pictures / Video



Watch our DIRECT-RO product [video](#)

Features

- ▶ Highly flexible 80 bar RO system for variable flow rates and high permeate yield
- ▶ High quality materials and components from brand manufacturers
- ▶ On-board sand filter unit with automated backwashing
- ▶ On-board influent pH adjustment system with anti-foam control
- ▶ Chemically enhanced CIP (“Cleaning-in-Place”) system
- ▶ PLC-automated process control equipped HMI with remote access function

Technical Details

Container color:	RAL 7035 ●
Pressure:	80 bar
Membranes:	organic, spiral wound, 8” modules
Sub-systems:	automatic pH adjustment, foam control, CIP, automatic sand filter
Measured data (online):	pH, conductivity, temperature, pressure, flow
PLC:	Siemens S7
Operation / HMI:	touch panel with graphical user interface, remote access possible via LAN
Safety equipment:	mobile eye shower
Sulfuric acid storage:	S, XL: inside or outside, M: outside only

PRODUCT OVERVIEW

WEHRLE DIRECT-RO

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Membranes



WEHRLE uses Spiral Wound membranes:

Space-saving due to horizontal construction and high membrane surface. This allows to fit **3 RO steps within one container.**

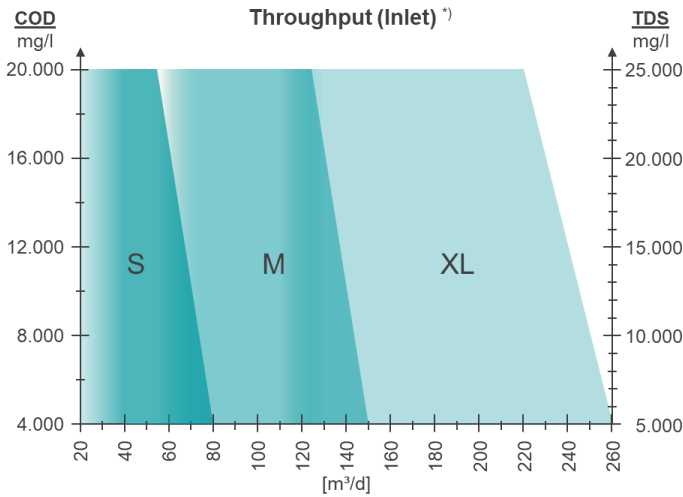
With 80 bar process pressure, **standard equipment & piping** can be used. This **reduces** the plant **operation costs**, especially for membrane replacement.

The **Feed & Bleed** configuration allows to vary the flow rate.

Membrane lifetime expectancies:

1st step: 1 ... 2 years, 2nd/3rd step: 3 ... 4 years.

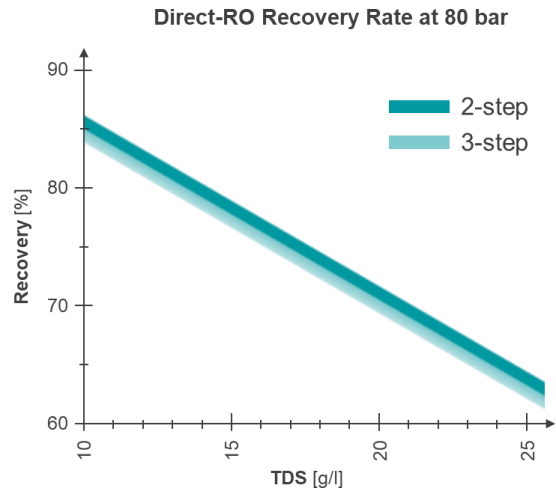
Model Selection / Throughput



S / M: 1 container 40' XL: 2 containers 40'

¹⁾ the higher level (COD or TDS) determines the working point

Recovery rate



Model Selection / Steps

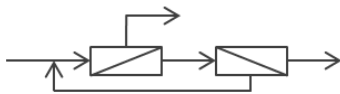
Rejection rates:

COD

NH₄-N

TDS

2

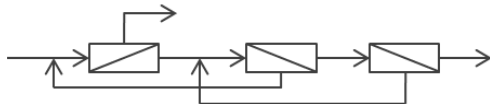


99 %

98 %

99 %

3



99.9 %

99.7 %

99.9 %

Internal concentrate recirculation optimizes recovery rate

Inlet Specification Limits ^{**)}

Feed Temperature: 0 ... 30 °C

Si: < 5 mg/l

Sum of Fe + Mn: < 50 mg/l

TSS: < 150 mg/l

More specifications

Wind load: Zone 3

Snow load: Zone 3

Earthquake: Zone 1

Altitude a. s. l.: max. 1,000 m

^{**)} exceeding these limits may reduce performance

Energy Technology · Environmental Technology · Manufacturing

Packages / Options

Advanced Automation Package containing

- ▶ PLC controlled pressure control valves
- ▶ PLC controlled CIP valves and cleaner pumps
- ▶ Advanced PC based process control system
- ✓ maximized permeate recovery at all times
- ✓ automatic CIP, based on process parameters
- ✓ in-depth evaluation, long-term recording of process data

OPEX Reduction Package containing

- ▶ Additional stand-by sandfilter
- ▶ Degasifier column
- ✓ improves plant availability
- ✓ pH-adjustment of effluent without need for chemicals

Hazardous Environment Package containing

- ▶ PE lining of container inside
- ▶ Air filter
- ✓ improved corrosion protection and system longevity
- ✓ reduces corrosive and odorous substances in the container ambient air

Hot Climate Package for average daily ambient temperatures > 20 °C containing

- ▶ Air condition
- ✓ to keep the inside container temperature below 35 °C

Cold Climate Package for average daily ambient temperatures < 0 °C containing

- ▶ Extra heater
- ▶ Container floor insulation
- ▶ Insulated external piping box
- ✓ to keep the inside container temperature above 5 °C
- ✓ reduce icing of external connections of the container

Basic Chemicals Package for commissioning & first weeks of operation (within E.U. only) containing

- ▶ Membrane cleaners
- ▶ Antiscalant
- ▶ Antifoam
- ✓ price on request

Spares Package for high availability containing

- ▶ Spare membranes and filters
- ▶ Spare part sets for all pumps
- ▶ Spare probes for essential sensors
- ✓ individual package compiled based on your budget

Extended Warranty Package (only in combination with Spares Package): price on request

Parts subject to wear and media contact are excluded

It only applies when operating the system according to our operating instructions

CSC Certification for overseas shipments: price on request

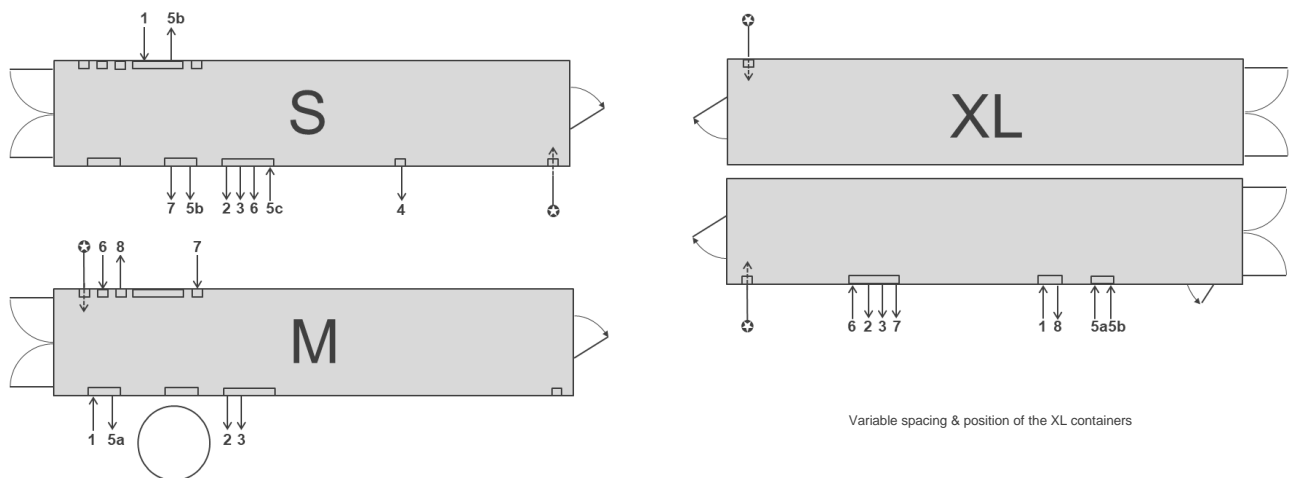
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Supplies by Client

Electrics:	3~/N/PE 400V / 50 Hz ¹⁾		
	S	M	XL
Main power switch:	160 A	250 A	400 A
Process water:	3 bar		
Chemicals: ²⁾	max.75% H ₂ SO ₄ , NaOH (if required), anti-scalant, anti-foam (if required), membrane cleaner		

Sketches

Connections:



Coupling Types	S	M	XL
1 Raw effluent / inlet:	DN 40	DN 40	DN 50
2 Permeate / outlet:	DN 40	DN 40	DN 50
3 Concentrate / outlet:	DN 40	DN 40	DN 50
4 Overflows:	2x DN 50	DN 50	n/a
5a Venting:	n/a	DN 80	DN 100
5b Venting:	DN 50	n/a	DN 100
5c Venting:	n/a	DN 40	n/a
6 Process water:	DN 40	DN 40	DN 65
7 Backwash water:	n/a	DN 65	n/a
8 Tank drain:	n/a	DN 50	DN 65
⊛ Electrics:	Terminal in switch cabinet, main switch, electrical equipment for connecting the transfer pump included		

Further Notes

For more information or individual upgrades please contact us!

¹⁾ 380 V and/or 60 Hz systems on request
²⁾ depending on requested discharge level

Subject to change without notice!