

ROTREAT
ABWASSERREINIGUNG GMBH
A ∞hydreatio company



**PURE WATER
FROM ANY SOURCE
AT ANY LOCATION**

www.rotreat.net



**“WHEN THE WELL’S DRY,
WE KNOW THE WORTH OF
WATER.”**

(Benjamin Franklin 1706 - 1790)

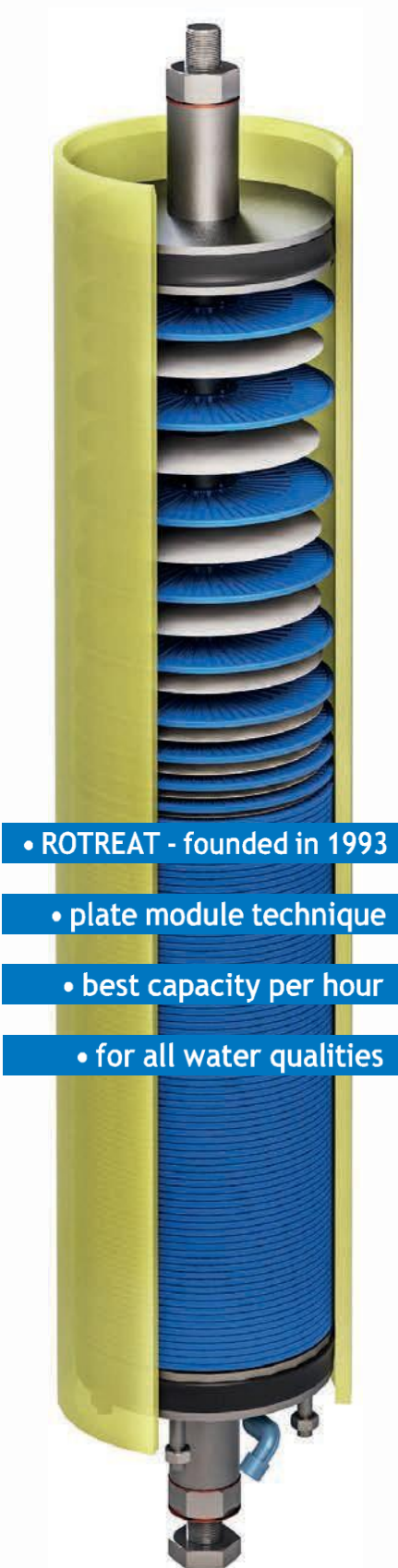
GENERAL INFORMATION

ROTREAT Abwasserreinigung GmbH a Hydreatio company was founded in 1993 and concentrates on developing and producing membrane filtration plants. Besides the plant technology the RCDT (Radial Channel Disc Tube) module system has been invented as an economic and efficient reverse osmosis device for the treatment of wastewater and salt and brackish water. In addition, ROTREAT offers MBR (membrane bioreactor) for a wide variety of industrial wastewater and contaminated surface water.

The RCDT 3.0 module system is the most advanced product in the DT technology offering membrane areas up to 13m² per module having the world largest DT module. The system pressure of the plant is usually up to $p = 90$ bar.

Over 500 mil m³ of wastewater has been treated with different water qualities. These units are located internationally. The equipment of such plants must grant especially high corrosion stability as well as it must be flexible enough to cope with the changing quality of the raw water containing highly colloidal substances.

Due to the unique design of the RCDT 3.0 module a membrane lifetime up to 5 years have been experienced.



• ROTREAT - founded in 1993

• plate module technique

• best capacity per hour

• for all water qualities



RCDT DISC 3.0

ROTREAT - The Specialist in
purification of
landfill leachate,
industrial wastewater...



THE PROCESS

Reverse osmosis is a crossflow filtration process, i.e., driven by pressure: untreated water flows across an active layer (membrane) at high velocity and the filtrate flow passes through the membrane in vertical direction. Membrane separation is quite a physical process, i.e., the components to be separated undergo neither thermal, nor chemical, nor biological changes.

Reverse osmosis allows the separation of low-molecular substances and inorganic salts. For this reason, reverse osmosis has proven its suitability in most different fields of application, such as:

- purification of landfill **leachate**
- effluent from **pharmaceutical industry**
- purification of **industrial wastewater**
- **desalination** of sea water for drinking water production
- **reject treatment** from Spiral RO
- effluent treatment from **textile industry** and **dyeing process**
- **tannery** effluent treatment
- waste water treatment from **distilleries**
- treatment of **compost plant** wastewater

PLANT TECHNIQUE

The plants are tailor-made according to the customers' demands. Four stages standard modular plants, which can treat leachate volumes from 0.5 m³/h to 15 m³/h, form the basis of the system. The modular system design also allows the construction of plants for bigger water volumes. If required, these plants can be equipped with permeating stages (2nd RO stage) to ensure, that even in the case of high pollutant concentrations the standard requirements are met. To increase the permeate yield. (= minimization of the concentrates to be disposed of) concentrate stages with high pressure technology up to 160 bar are offered.

Recovery rates up to 95%

The plants are designed in standard modular form. The individual sections are installed on a common foundation frame, made of stainless steel to ensure the longevity of the system. The plants are designed in such a way that they can either be placed in a hall or installed in a container (standard ISO sizes). The standard modular form allows ready-for-operation assembling of the plants in the factory, including complete acceptance testing. This allows quick installation and start-up of the plant at the intended site.

THE RCDT 3.0 MODULE

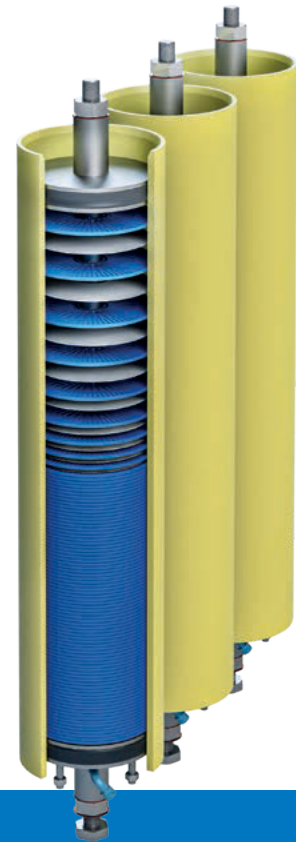
This module consists of a pressure tube and hydraulic discs which are held by a centre tension rod. Octagonal or round membrane cushions lie between every two discs.

Owing to this special construction, open flow channels are formed between the hydraulic discs and the membrane cushions where the raw solution concentrates. The individual channels are joined together by openings in the discs, which are arranged in annular pattern, so that the feed water flows radial across the membrane cushions, alternately from the inside towards the outside.

The membrane cushions are made of two single membrane discs with an intermediate layer(spacer). The membranes are manufactured from modified polyamide, the material of intermediate layers is polyester. Using the ultrasonic welding technique the medium cannot encounter other materials (membrane glues, etc.). Besides various reverse osmosis membranes and nanofiltration membranes are deliverable.

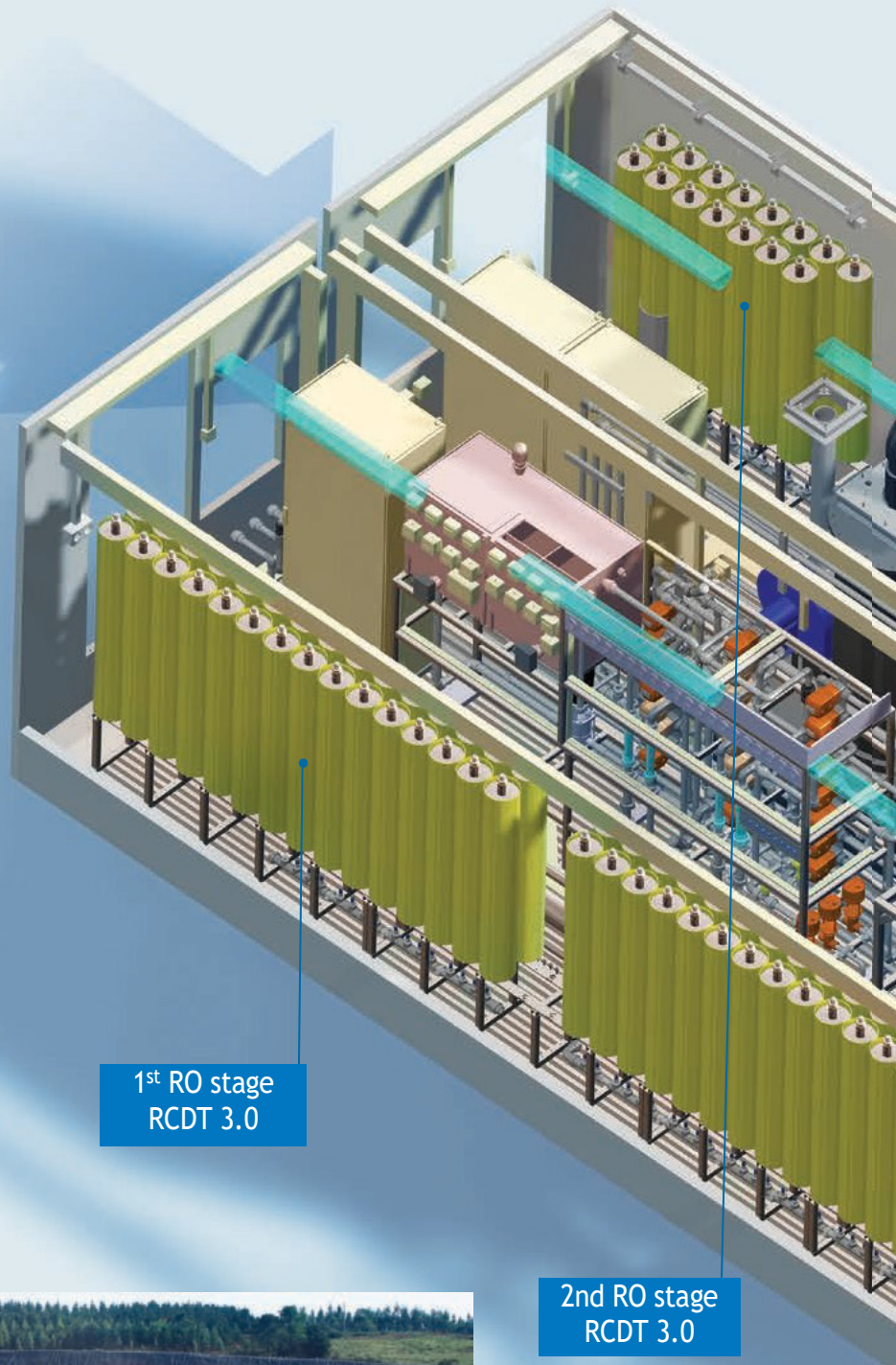
Only 6,3 kWh per m³ raw water

	single stage up to 90 bar kWh/m ³	double stage up to 90 bar kWh/m ³
Common DT Module 9,5 m ²	7,7	9,7
RCDT XXL Module 13 m²	6,3	8,4



Overview

Of a 2 stage RO RCDT 3.0
module system with
pre-treatment and
post-treatment.

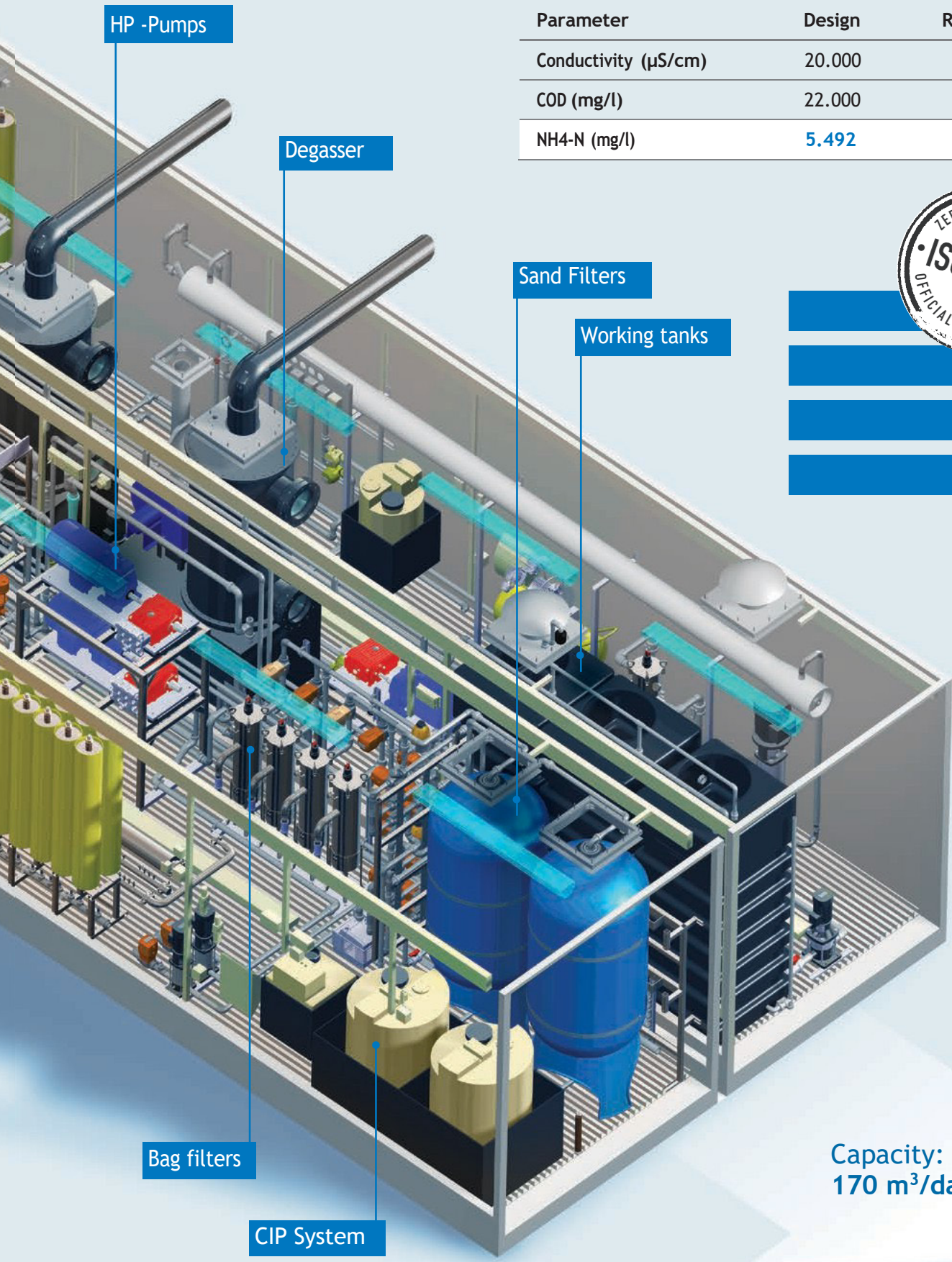


1st RO stage
RCDT 3.0

2nd RO stage
RCDT 3.0



Capacity:
600 m³/day



Parameter	Design	Restriction
Conductivity (µS/cm)	20.000	
COD (mg/l)	22.000	70
NH4-N (mg/l)	5.492	2



Capacity:
170 m³/day

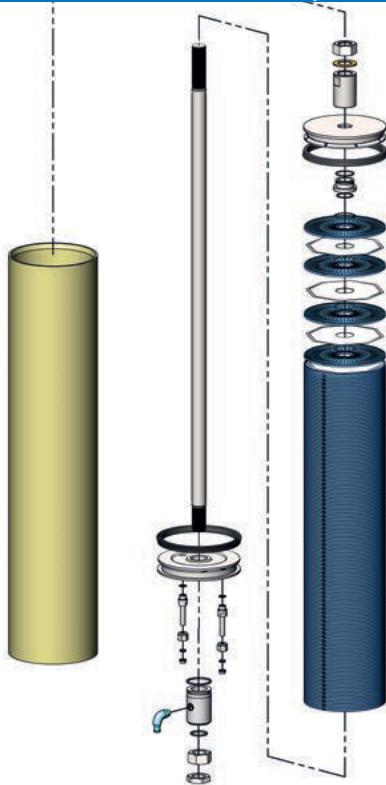


State of the art

standards and

qualities for a

RCDT 3.0 RO system



TEST UNITS

For new installations we select the appropriate model, using data generated on site. Testing is usually carried out by a low-capacity full-scale mobile plant. Testing through ROTREAT includes delivery of unit, installations, set up, operation and test report.

This enables us to offer customers the assurance that every single aspect of a future system meets consistently high standards.

FOCUS ON QUALITY

RCDT 3.0 MODULE

- Operating pressure: 90 bar
- Stainless steel flanges and related parts 1.4571
- Tension rods 1.4057
- Nuts Ni-coated
- Distance tube 1.4301

TECHNOLOGIES IMPLEMENTED IN THE DESIGN AND MANUFACTURING OF SYSTEMS

High pressure pumping systems

- Direct transmission between electric motor and high-pressure pumps
- Piston diaphragm high pressure pump with stainless steel head
- Flexible high-pressure hoses with stainless steel crimp fittings

Electric cabinet's operational interface

- Fully pneumatic isolated electric cabinets
- Cabinets provided with cooling systems
- Cabinets provided with Panel PC with touchscreen in industrial stainless steel casing IP 65

- Panel PC with external power supply with no need of cooling fan
- Panel PC provided with SCADA software on Windows OS with full predisposition for remote access
- Additional back-up panel as interface with the PLC in case of Panel PC not available

Pre and post treatment applied technologies

- Fully automatic raw water conditioning system integrated in the feed tank
- Stainless steel bag filter housing
- Pretreatment consisting of fully automatic sand filter

MATERIALS USED FOR THE MANUFACTURING OF THE SYSTEM

Isolated High-Cube containers with stainless steel walls

- All frames in 304 stainless steel
- Corrosion free PE-HD/PP material for all tanks

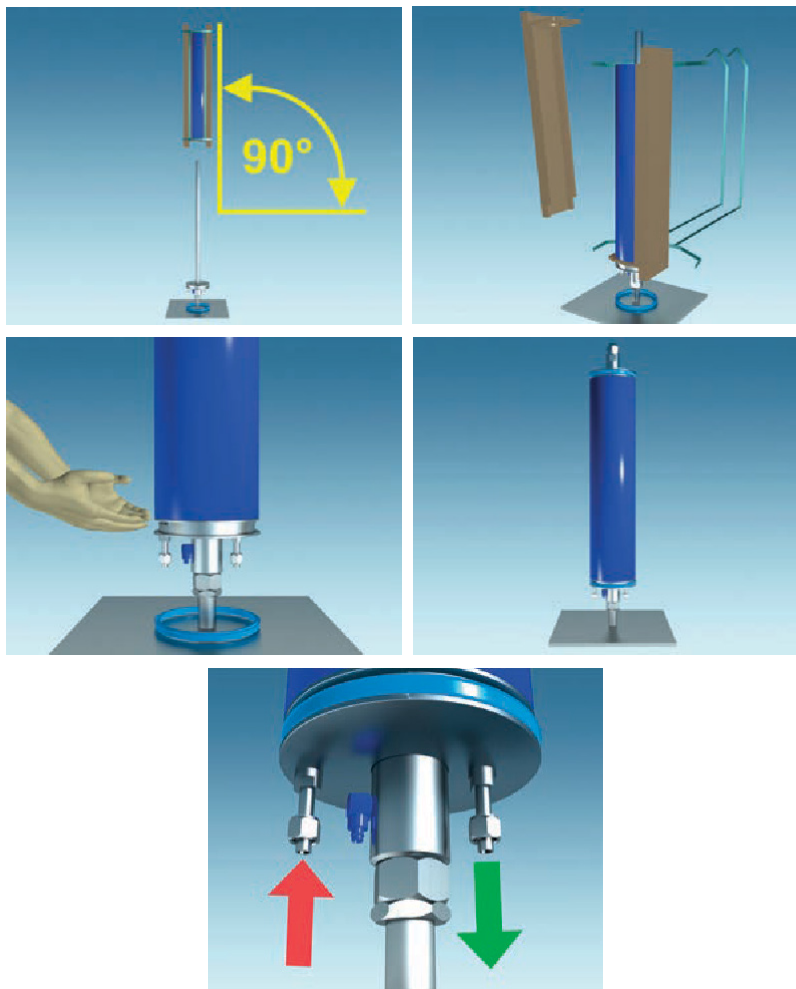
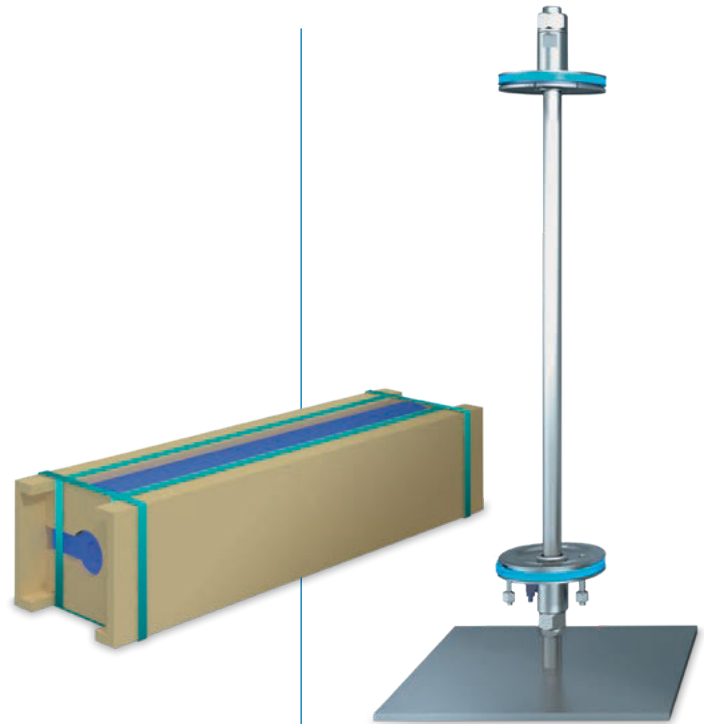
- Use of plastic blowers for the degassing system to avoid corrosion
- All electric installation in plastic corrosion free cable ducts
- No black steel mountings or screws allowed

THE EASY CLICK MODULE

EASY CLICK is a ROTREAT patent for an easy way to exchange modules directly on site by the customers own work force.

Basic pros:

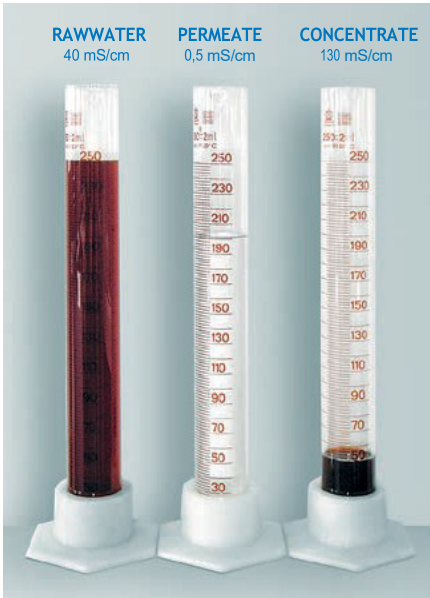
- Save up to 50% of costs compared to standard DT
- Quick availability of the EASY CLICK exchange modules
- The customer gets the EASY CLICK Module ready for assembling, including "How-to-do"-Instructions
- Less weight - less transport costs
- Membrane area from 7 - 13 m² per module available
- RCDT 3.0 with up to 13m² membrane area/module



EASY CLICK Module

compatible with all

DT-modules



ANALYSES of a landfill leachate

		Leachate	Permeate
Temperature	°C	20,2	24,8
pH-value	-	8,32	8,02
Conductivity	S/cm	44.000	68
COD	mg O ₂ /l	24.300	< 15
BOD5	mg O ₂ /l	10.770	4,8
Ammonium	mg/l	4.620	< 10

Our extensive experience has led us to firmly believe, that the RCDT 3.0 technology is the most reliable RO technology worldwide. Furthermore, we are confident that we are the ideal partner to apply this technology.

If, after reviewing our literature and customer references, you find our technology relevant to your leachate or wastewater challenges, don't hesitate to contact us. We would be delighted to discuss your specific needs further and potentially arrange a visit to witness our proven and patented technology in action at one of our operational sites.

LOCATIONS WORLDWIDE

Over 100 mil m³ of wastewater has been treated in an environmentally friendly and reasonable way for the past 27 years. Our Locations are in...



- Australia
- Austria
- Baltic Countries
- Bosnia and Herzegovina
- Brazil
- China
- Croatia
- Czech Republic
- Finland
- Germany
- Greece
- Hungary
- Malta
- Mexico
- Portugal
- Romania
- Serbia
- Slovakia
- Slovenia
- South Korea
- Spain
- Sri Lanka
- Tunisia
- Turkey
- Vietnam

...equipped with
RCDT-Technology
 for the purification
 of wastewater



RCDT 3.0 EMERGENCY SYSTEMS/RENTAL SYSTEMS

Sometimes urgent problems must be solved, and the necessary financial funds are not available. In such a case the alternative is a containerized rental system with capacities up to 150m³/d installed in one 40-foot container. Depending on the site preparation, installation times including startup of 2 days are experienced. ROTREAT disposes of a pool of leachate treatment plants which can be made available at very short notice. Thus, it is also possible to treat seasonal hydraulic peaks, which cannot be managed by an already existing plant.

Installation time two days.

ROTREAT RCDT 3.0

systems operate at

anytime anywhere!

Guaranteed!





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