



# WASTEWATER ENERGY SOURCE

# RCCR





# RCR

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### THE HEAT EXCHANGER FOR HEAVILY POLLUTED WATER

The RCR is a non-conventional heat exchanger especially designed to recover otherwise wasted energy out of polluted wastewater. The RCR is able to heat up fresh water and simultaneously cool down effluents, thus cutting down energy bills and meeting legal requirements on effluent temperatures. Its unique operating principle, based on a rotating exchanging shaft, makes the unit self-cleaning. The RCR is used in several industries like: textile care and finishing, dyeing, leather, paper and food. The RCR is a free standing unit occupying minimal space, usually placed at the end of the processing line, and does not interfere with the process itself. Gravity fed, the RCR does not need pumps except in special situations where the flow is intermittent and thus a surge tank is indicated.



### IS IT SOMETHING NEW?

The most common types of heat exchanger in industrial applications are the "shell and tube" and "plate and frame" types. In all cases where the liquid streams are clear and free



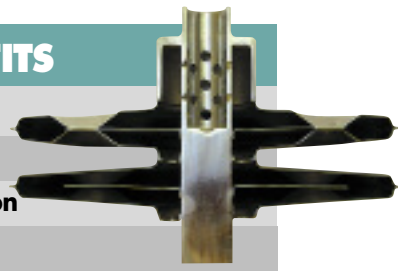
of waste (like lint, resins and other pollutants), these exchangers work adequately. However, when pollutants are contained in the waste stream they foul and eventually plug up the heat exchanger. This means that valuable time is needed for maintenance and cleaning of the heat exchanger, which can get rather messy as well as costly.





## BENEFITS

- » Self-cleaning
- » Highly efficient
- » Uninterrupted operation
- » Easy to install
- » Does not influence the existing process
- » Low space requirements: 2-5 m<sup>2</sup>
- » Entirely made of 316 L - stainless steel
- » No need for a pump
- » No need for filters



*Heat recovery from a discontinuous process: exchangers installed in a water treatment plant*

### WHY IS THE RCR DIFFERENT?

The RCR is composed of two main elements. First, there is an open stainless steel trough through which the dirty effluent flows by gravity. Secondly, there is a series of exchanging shells connected to a long hollow shaft. The clean process water flows inside the shaft assembly, which is suspended inside the trough and rotated by a small electric motor. This accomplishes two things: it suspends all pollutants by the stirring action of the rotation while keeping the thermal surfaces clean and increasing the thermodynamic efficiency of the exchanger because of the reduction of the boundary layers.

### WHAT ARE THE REQUIREMENTS?

The unit is completely self-cleaning. There are no tubes ever to be cleaned or filters required. The RCR is a modular system, which makes it ideal for placing in small spaces. It does not

influence the process. It installs very quickly with a limited amount of piping involved. There are no expensive pre-filters required. No holding tanks or diverter valves are necessary for continuous processes. Batch operations or those plants that already have waste pits require a small sump pump to feed the liquor to the RCR.

### WHAT ARE THE EXPECTED SAVINGS?

The high efficiency of the RCR gives a quick return on investment. Although plant conditions vary depending on your particular flow rates and temperatures, it is our experience that the RCR pays for itself in about three to six months. With the help of a computer program, we can calculate what the water temperatures and energy savings would be when an RCR is used in your process. Visit our dedicated website [www.pozzienergy.it](http://www.pozzienergy.it) to get a detailed calculation yourself!

### RCR Wastewater Energy Source Performance Evaluation Tool

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Step 1: Fill in water conditions in your plant

Dirty water flowrate (m3/h)	15
Dirty water temperature (°C)	84
Clean water flowrate (m3/h)	15
Clean water temperature (°C)	12

Step 2: Gather energy management information for your site

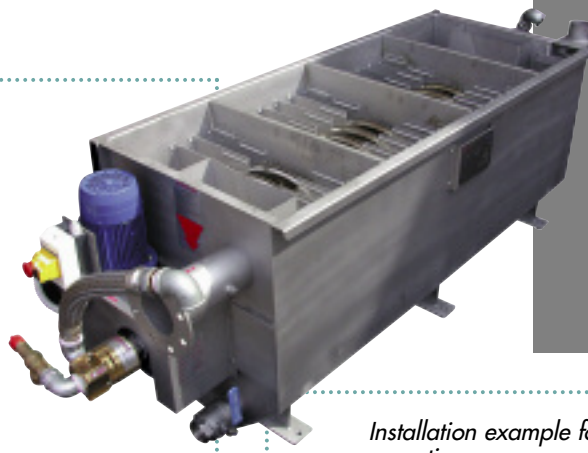
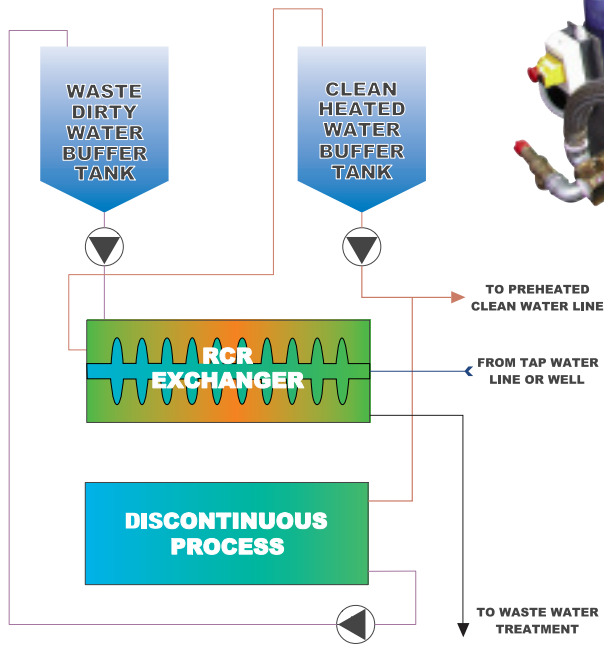
Working hours per week	80
Working weeks per year	50
Fuel cost (EUR per m3 of Natural Gas)	0.23

Step 3: Review your savings and investment data for one RCR25/SE

You will achieve the following:

- 1- Cool your dirty water to 30.8°C
- 2- Heat up your clean water to 61.8°C
- 3-Save 20800 kilowatt hour/day corresponding to a 69% recovery efficiency
- 4-Save 395000 cubic meters of Natural Gas per year (or about 90800 EUR)
- 5-Payback of 2.3 months

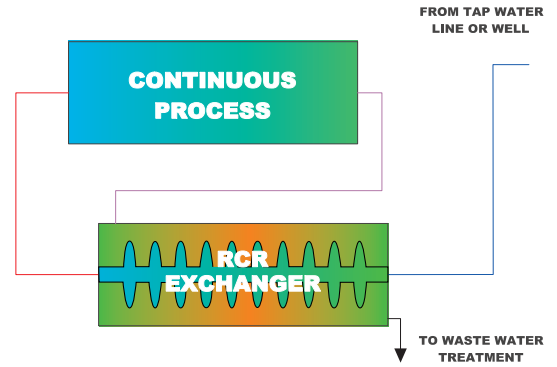
Installation example for an intermittent process



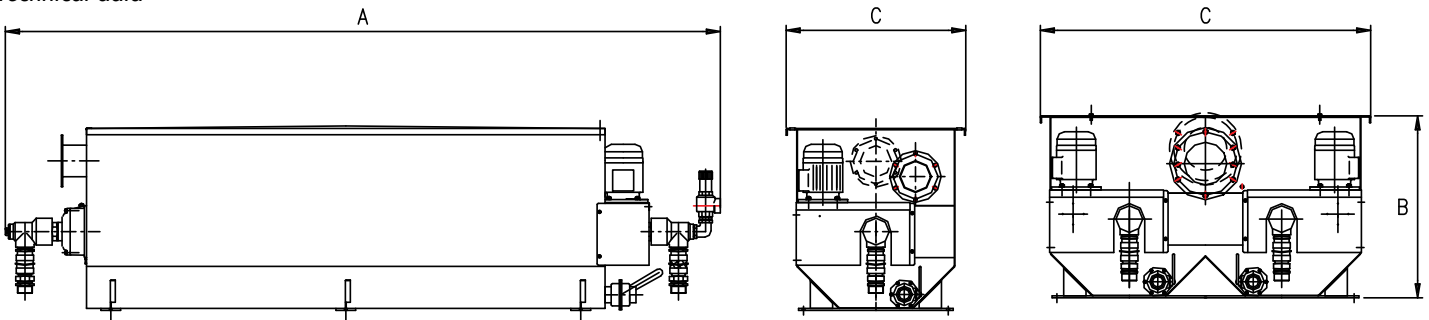
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Installation example for a continuous process



Technical data



MODEL	A [mm]	B [mm]	C [mm]	Max waste flowrate [m3/h]	Waste water pressure drop [bar]	Clean water pressure drop [bar]	Max clean pressure [bar]	Empty weight [kg]	Electrical Power [kW]
RCR 10/SE	2020	735	725	6	0.005	0.45	3	370	0.55
RCR 15/SE	2440	735	725	9	0.005	0.4	3	510	0.55
RCR 20/SE	2890	735	725	12	0.005	0.4	3	600	0.55
RCR 25/SE	3320	735	725	15	0.006	0.5	3	695	0.55
RCR 30/SE	3680	735	725	18	0.007	0.6	3	790	0.55
RCR 40/SE	2890	735	1350	24	0.005	0.4	3	1230	1.10
RCR 50/SE	3320	735	1350	30	0.007	0.6	3	1470	1.10
RCR 60/SE	3680	735	1350	36	0.007	0.6	3	1550	1.10

RCR is also available with a higher trough to compensate internally for some flowrate variation (+H option). In this case C becomes 860 mm.



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