

*Pero*

Advanced Parts Cleaning Systems



CLEANING POWER & PERFORMANCE: **FIRST CLASS**

**PARTS CLEANING PLANT**

for cleaning with all standard solvents: hydrocarbons, chlorinated hydrocarbons and modified alcohols

**R2**

# „FAST AND CLEAN“

The R2 cleaning plant degreases, cleans and preserves components in a most energy-efficient, economical and fast manner.

## PLANT | OPTIMISED FOR CLEANING WITH SOLVENTS – UNIVERSAL PLANT FOR MULTIPLE MEDIA

The plants of the R2 series make best use of the cleaning and degreasing properties of the various solvents. Operators can thus choose from a range of solvents in order to achieve best cleaning results for their specific tasks.

Thanks to the PERO vacuum technology, the plants can be run at low temperatures to protect both the parts to be cleaned and the solvent. The R2 thus guarantees excellent technical cleanliness combined with a minimal carbon footprint.



## PARTS | COST-EFFECTIVE CLEANING OF A WIDE RANGE OF PARTS

Machined and formed parts components

- Manufactured parts and assemblies
- Drilled, turned and milled parts
- Punched, drawn and extruded parts
- Precision ground parts
- Close tolerance electro-mechanical items
- Engine and motor industry parts
- Parts for use in jewellery, watches and precision optical instruments
- Parts made in plastics, glass, ceramics ... and many more!

Exceptionally efficient cleaning under vacuum – also for parts with drill holes, undercuts, blind holes and components made in sintered metals

## PARTS CARRIERS | MACHINE DESIGNED FOR VARIOUS FORMATS – CATERING FOR OPTIMISED COMBINATIONS

### CAPACITY:

From standard size 380 x 220 x 200 to **1,000 x 480 x 300 mm**  
up to a total batch weight of **200 kg**

### ENSURING:

- Efficient cleaning
- Gentle treatment of surfaces
- Optimised parts positioning
- Excellent parts protection during transport

### Cleaning of

- Bulk material
- Rack parts
- Individual components
- Small parts

### Cleaning in

- Baskets; universal / system / small parts baskets
- Basket-in-basket / carrier systems
- Metal crates; pallets
- Insertion pallets; base inserts
- Parts-specific inlays



Choosing the most suitable parts carrier for a cleaning task brings many advantages as regards throughput rate, cleaning results and cost effectiveness

The bottom line – **your advantages**

→ Remove dirt in the most targeted and efficient manner using the most effective solvent.

→ Process a wide range of parts made from many different materials using a single cleaning plant.

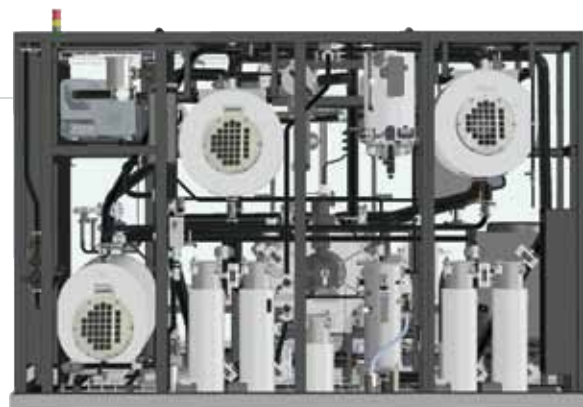
→ Use the parts carriers you already have and combine them for best results.

## PERFORMANCE | UNRIVALLED THROUGHPUT RATE

The throughput rate of a parts cleaning plant is determined primarily by the capacity of the parts carriers and the batch cycle time.

Thanks to its innovative design and advanced processing technology, the R2 offers unrivalled throughput rates.

As a result, cleaning with the R2 is more energy-efficient while the quality of the process is enhanced.



2-bath unit: Optimised arrangement of machine components



Roller shutter at the rear (optional): Saves space and allows for easy access

## Custom-engineered

The standard model of the R2 series already offers outstanding cleaning performance and great efficiency. As the R2 is a modular unit, its performance can however be further optimised to suit your specific needs.

Whether 1-bath, 2-bath or 3-bath model: the R2 takes up only minimum space. The R2 meets the requirements of operating and service staff: All service points are easily accessible.

→ Compact design – optimised access to machine

## CHARGING



Manual roller conveyor



Factory trolley



Automated charging unit (optional 1, 2 or 3 lanes)

## ENERGY EFFICIENCY | OPTIMISED PLANT DESIGN PROTECTING RESOURCES

Energy-Manager:

- Adjustment of heating output in vapour generator for maximum efficiency
- Operation in energy saving mode
- Heat recovery
- Low power consumption and low connected load
- All baths are heated with solvent vapour
- Process-controlled vacuum pump
- Insulated pipes; insulated and lined vessels
- Minimum solvent consumption thanks to vacuum technology



Energy-saving and filtration settings shown in the graphic display

The bottom line – your advantages

→ The compact R2 plant takes up only minimal space in your factory.

→ Thanks to the innovative, modular design, you can invest in a tailor-made solution that meets your requirements.

→ You choose the machine components, parts carriers and charging unit that best suits your needs as regards ergonomics and technical cleanliness.

# „SIMPLE AND COMPLETE“

We have thought of everything: from the parts and your cleanliness requirements to remote maintenance.

## COMFORT

## EASY OPERATION AND MAINTENANCE

- Touch panel control
- Week timer
- Programme pre-selection
- Automatic shift function
- Profinet for remote maintenance and data transfer
- Automated lubrication of basket rotation unit
- Roller shutter at the rear of machine



## Intuitive control

The well-designed human-machine interface of the R2 allows for easy and safe machine operation. Clear symbols make the display particularly user-friendly. Multiple maintenance programmes allow for the automated maintenance of the cleaning medium, filters and distilling unit. Thanks to the week timer, the unit is automatically serviced to be ready for operation at the start of the next shift.

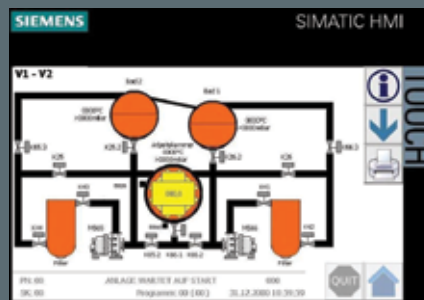
## Flexible cooling options

Water-cooled unit: Depending on actual site conditions connection to

- on-site cooling water circuit
- external air-cooled heat exchanger (optional)\*
- Closed loop water return cooler (optional)\*

Safe operation also at increased ambient temperatures.

\* Installation: adjacent to the unit or outdoors.



## Safety

- Redundant process monitoring system; acid sensor; vacuum system preventing emissions
- Additional: Fire and explosion safety equipment (for solvents with flash point > 55 °C)
- Base tray conforming to German Federal Water Act WHG, dimensioned to hold the entire solvent content of the machine
- Machine to European Machinery Directive 2006/42/EC and product norm EN 12921

## Remote maintenance



Secure remote maintenance access to plant via internet (optional). Remote access enhances the availability of the plant and helps reduce service costs.

### The bottom line – your advantages

→ Easy operation and maintenance. No need for time-consuming staff training.

→ Your employees work in a safe environment with minimum emissions.

→ Fast and effective remote maintenance by Pero service available as an option.



## CLEANLINESS

MULTIPLE PROCESSES  
CATERED FOR BY STANDARD MODEL

### Mechanical cleaning features

- Swivelling, rotating; Step rotation control. Diagonal positioning of parts carriers
- Full bath, flooding and splash flooding
- Splash flooding across entire depth of processing chamber
- Vapour degreasing
- Ready for upgrading with ultrasound unit

### Drying

Condensate drying in combination with vacuum technology

### Filtration

- Continuous full-flow filtration of medium: during filling and emptying of processing chamber
- Additional bypass filtration of tanks

### Bath maintenance

- Consistent high distillation performance
- Residual distillation under vacuum



Filters with sealing collars and mesh sizes of 150 to 1 µm clean the entire solvent volume of each bath



The parts movement is adjusted for optimum cleaning, based on the actual parts geometry

## Vapour degreasing

Solvent vapour condensates on the parts in the processing chamber, removing all oil and grease.

- If implemented as the initial step in the cleaning cycle (optional), vapour degreasing keeps the bath clean. For some degreasing tasks, vapour degreasing might even do away with the second bath.
- Heats the parts to the temperature required for fast and economical vacuum drying.

## First bath in cleaning cycle

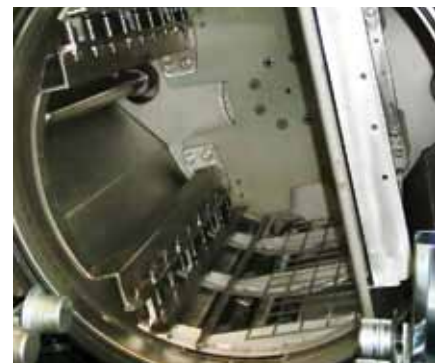
The solvent is pumped from the tank through filters into the processing chamber. Depending on the requirements, the parts are mechanically moved inside the chamber for more effective cleaning. The solvent is heated by solvent vapour from the vapour generator for maximum energy efficiency.

## Second bath (optional)

Solvent from a second tank is used to rinse the parts to remove brass chips, grinding dust residue, polishing paste and similar contaminants. This process might be omitted, if no such particles are present on the parts. Alternatively, the second bath can be used as a preservation bath (optional, with switching option).

## Ultrasound unit (optional)

- Push-pull oscillator for efficient ultrasound transfer to medium
- Enhances the efficiency of the vacuum technology
- Parts are moved during treatment for best cleaning results



Optimised position of oscillator for maximum mechanical effect

The bottom line – your advantages

→ The required technical cleanliness is achieved by means of standard cleaning programmes or user-defined programmes.

→ At the PERO Technology Centre the most cost-effective cleaning method (parts geometry and contamination) is determined.

→ The high-performance vapour generator automatically disposes of all residual contamination. Clever energy-saving technology and heat recovery are standard.

# TECHNICAL DATA

Designation	Data	
<b>External dimensions:</b>	With (1-bath / 2-bath / 3-bath)	3.09 / 4.19 / 5.06 m
	Depth (without charging unit)	2.1 m
	Depth with automated charging unit, 1-lane	3.62 m
	Installation height (without / with three-colour signalling lamp)	2.95 m / 3.03 m
	Charging height for baskets	810 mm
<b>Max. basket dimensions <sup>2)</sup>:</b>	Length x width x height (standard / customised)	660 x 480 x 300 mm / 1,000 x 480 x 300 mm
<b>Max. batch weight <sup>3)</sup>:</b>	Parts and carrier	200 kg
<b>Cleaning media:</b>	Chlorinated hydrocarbons (PER, TRI, MC), hydrocarbons and special modified alcohols (with flash point > 55°C)	
<b>Throughput rate:</b>	Number of batches per hour for 70 kg steel: Cleaning > vapour degreasing > drying	1 bath: approx. 16
	Cleaning > rinsing > vapour degreasing > drying	2 baths: approx. 14
<b>Supplies:</b>	Compressed air	6 bar
	Cooling water <sup>4)</sup>	max. 32 °C, Δp= 3 bar
<b>Transport:</b>	Machine (weight / dimensions)	1-bath: 5,000 kg/3,200 x 2,200 x H 2,950 mm 2-bath: 6,000 kg/4,400 x 2,200 x H 2,950 mm 3-bath: 7,000 kg/5,100 x 2,200 x H 2,950 mm
	Height without loading device 2.8 m	
	Automated charging unit, 1-lane (weight / dimensions)	1,200 kg / 4,000 x 1,400 x H 2,000 mm

1) All specifications subject to changes. Errors and omissions excepted.

2) For basket and combination options, see page 2 ff. Suitable for 1-lane, 2-lane or 3-lane charging other basket dimensions and parts carrier dimensions available on request.

3) For higher weights, contact PERO.

4) Other technical options and configurations available on request.

