

## AC2E Series

Rack conveyor dishwashers



# 5 good reasons to choose the AC2E series

## 1 Economy

AC2E series dishwashers are equipped with the ECO2RINSE system, which dramatically reduces the use of rinse water, a crucial factor and the principal cause of energy consumption and detergent use.

## 2 Hygiene

The weld-free deep-drawn tank with rounded interior corners and the vertical self-draining pump ensure optimum hygiene.

## 3 Performance

All modules, also available as corner units, allow the AC2E model to be adapted perfectly to user requirements, regardless of the layout and surface area of the premises.

## 4 Reliability

Integral balancing springs and side safety hooks make it easier to open and close the insulated door. Diagrams and spare parts lists can furthermore be viewed 24 hours a day on the Internet.

## 5 Quality

All AC2E series machines are designed and built in an ISO 9001:2008 certified production plant.





# AC2E Series

## Rack conveyor dishwashers



AC2E



AC2AE P5



AC2E P6



AC2AE P9

### RANGE

Compact solutions adaptable to all environments thanks to the new range of Comenda AC2E dishwashers; an innovation that is the result of 50 years of experience in the development of state-of-the-art solutions in terms of both design and performance. Suited to all catering premises, big or small, the new series washes up to 220 racks an hour.

The basic concept of the new models is their modularity. Each dishwasher consists of individual modules that can be assembled according to the customer's productivity requirements and the space available. This feature – unique to Comenda – allows each dishwasher to be customised in its layout, providing for the prewash, wash, Eco2rinse and dryer modules to be installed in a line or in a single or double corner configuration. Optimum use is therefore made of the available space, rationalising and simplifying the work of dishwasher operators. A further improvement has been made to the AC2E series models - in order to achieve even greater optimisation of consumption, the Eco2rinse module has been installed in a separate section, thus creating a drip-zone between it and the wash zone. This solution ensures that the dishes reach the final stage less laden with water and detergent, meaning that a small amount of water will be needed to rinse them, thus also reducing energy consumption and handling costs.

The smart design of the new Comenda machine's washing system offers an additional benefit: it allows the effectiveness of the pumps to be increased by having the suction positioned at the lowest point of the tank, thus ensuring greater capacity and a reduced rated power. Furthermore, the positioning of the pumps, with their associated piping and wash columns, on the outside of the tanks, allows an optimum standard of hygiene to be achieved, avoiding any accumulation of dirt in areas that are hidden or difficult to access for cleaning purposes.

The AC2E series of dishwashers ensure optimum water consumption, cut down on the use of chemicals and reduce energy requirements: further confirmation of the ECO2 production philosophy applied by Comenda, an ISO 14001:2004 certified company that cares for the environment and is committed to developing economical washing systems.

## Types of use



. Cafés



. Canteens



. Restaurants

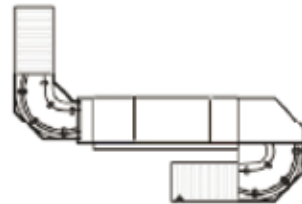
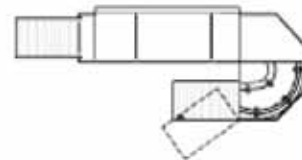
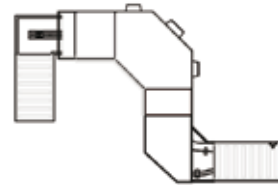


. Hotels



. Hospitals

## Configuration examples



### KEY FEATURES

- AISI 304 stainless steel tank chassis and panelling
- Inspection doors with integral balancing springs
- Compact installation dimensions
- Stainless steel upper and lower inspectable washing manifolds with negative embossed anti-drip nozzles
- Deep-drawn tanks with rounded corners
- Self-draining vertical pumps
- Door wipe seal for constant cleaning of the inside of the door
- Whole tank stainless steel filter and pump suction filter
- Electronic control panel with digital display temperature readout
- Double-wall doors
- 24V control circuit
- Economiser that activates rinsing only when rack passes through
- Electrical setup for connection of dosing devices for chemicals
- Machine side disconnection switch
- Digital water flowmeter with total rinse water consumption and machine run time
- All prewash sections with inspection door



# FEATURES

## and details



### WASHING SYSTEM

Stainless steel upper and lower washing manifolds with negative embossed anti-drip nozzles and inspection cap.



### TANK FILTERS

Complete coverage of the tank with stainless steel filters plus pump suction safety filter.



### ROUNDED CORNERS

Wash tank with rounded corners to prevent dirt formation. This structure also allows vertical installation of the self-draining pump.

## INSULATION

Thanks to the thickness of the doors, the insulation is particularly efficient - energy dispersal and noise levels are in fact significantly reduced.



## DOOR WIPE SEAL

The special shape of the seal allows the door to be cleaned automatically when opening and closing.



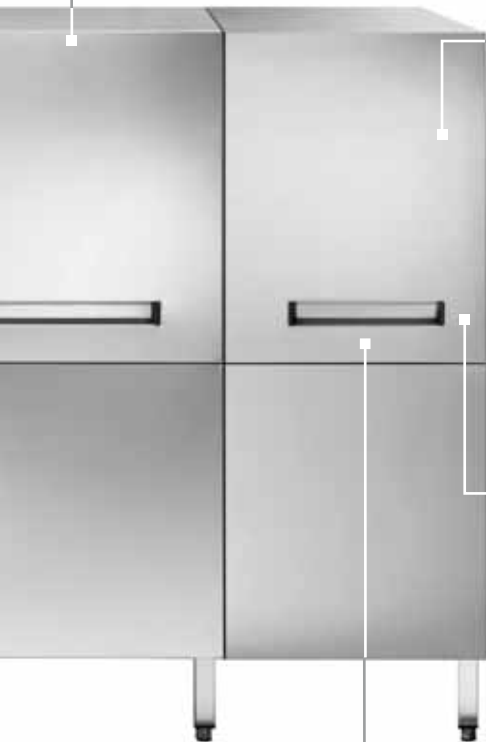
## DOOR INTERIOR

Inspection doors with integral balancing springs allow smooth and hygienic surfaces to be achieved.



## ECO2RINSE

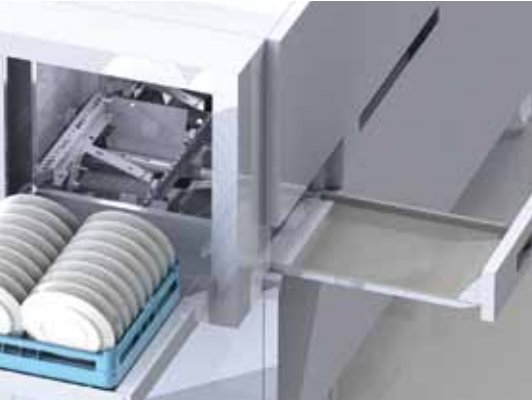
The ECO2rinse system is installed in a separate section, with an inspection door, away from the jets of soapy water in the wash areas. Is also equipped with the PRS system.



# State-of-the-art TECHNOLOGIES



## PRE-WASH Waste recovery



**P5, P6 AND DHM PREWASH AREAS**  
Waste management guidelines encourage maximum waste recovery for the purpose of processing and reuse and require discharges of greasy water to be significantly reduced.

**THE DUAL FILTERING SYSTEM DESIGNED BY COMENDA HAS THIS EFFECT.** The waste removed in the pre-wash area is collected in a cartridge filter, which can

be taken out for cleaning, even during washing operations, without stopping the machine.

A second filter positioned directly above the pre-wash tank stops the dirt falling back into the tank during this operation.

A third filter is in any case located on the suction pump in order to protect it.



## WASHING Tanks and washing systems



**The system allows the efficiency of the pump to be increased by ensuring that suction takes place at the lowest point in the tank.**

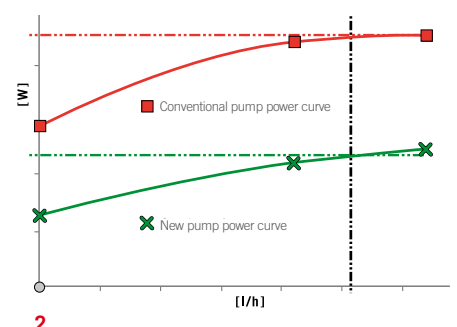
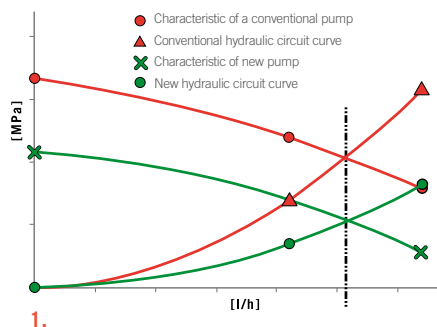
The maximum efficiency of the pump is therefore ensured at its operation point, with a reduced power rating.

The position of the pump, the suction and discharge pipes and the washing columns on the outside of the tank, allow optimum hygiene

to be achieved, preventing any dirt being deposited in corners that may be hidden or difficult to access.

Furthermore, the pump is mounted on anti-vibration supports and the connection to the tank consists of rubber hoses, all of which prevents vibrations being transmitted to the machine structure and compromising the mechanical operation of the assembly, while significantly reducing the noise produced by the machine.

1. The new hydraulic circuit allows the pump to have a lower operation point on the curve compared to a conventional circuit, while maintaining an identical flow rate.
2. The rated power of the pump is therefore lower for the same flow rate.







# ARC Triple effect dryer with integrated heat recovery unit



**THE NEW ARC SYSTEM ALLOWS THE HOT AND HUMID AIR FLOW CREATED INSIDE THE MACHINE TO BE UTILISED.**

**First effect: dehumidification of the air in the machine.**

The recovery unit removes the hot and humid air, passing it through the condenser battery, where cold water runs in the opposite direction, thus creating the following two effects: the humid air condenses inside the battery and is not released into the washing area; the cold water recovers the heat from the air and warms up before being fed into the booster, allowing a substantial saving on heating power. Furthermore, this suction and recovery area, located in the hottest section of the machine (between Eco2rinse and drying), increases the effectiveness of this initial action.

**Second effect: managing the evaporation of hot air from the dishes.**

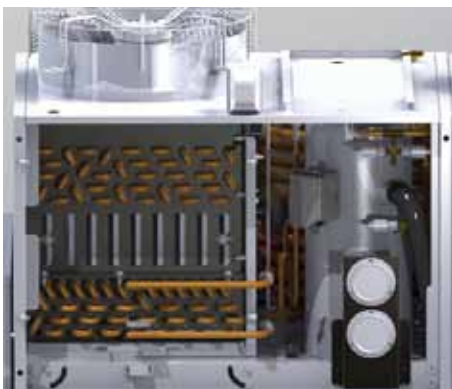
The recovery unit contributes to drying the dishes by removing the hot and humid air produced by evaporation of the water remaining on the dishes.

**Third effect: blowing of hot air.**

By using dehumidified air, the power of the drying tunnel heaters can be significantly reduced. The drying fan recycles some of the hot air passing through the heaters, increasing its temperature while reducing its humidity. The Comenda ARC system provides this correct balance between the air removed by the recovery unit and blown by the fan. The volume of air extracted by the machine is therefore dramatically reduced compared to conventional models.



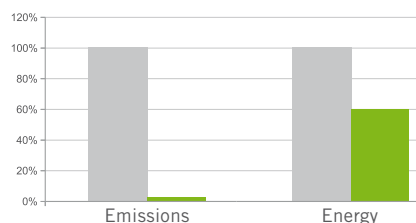
# WP Heat pump



**ENERGY SAVING AND A HEALTHIER ENVIRONMENT**

Specifically designed for AC2E rack conveyor machines, the dual effect WP7 heat pump allows savings of up to 40% to be achieved in the energy normally used to heat the water. The system's capacity to absorb

the heat produced by the machine considerably reduces the latent heat because the extracted, cooled and dehumidified air is released directly into the premises according to VDI 2052 specifications, creating excellent working conditions in the washing area.



	Emissions	Energy
STD standard	100%	100%
+ WP	2%	60%

# State-of-the-art TECHNOLOGIES

## TECH CONTROL PANEL

All AC2E series models are fitted with TECH controls as standard. Simple and intuitive, it allows the temperatures in the various areas of the dishwasher to be read on a digital display. It is simple enough to be used by untrained staff. Dishwasher consumption is always an important factor for washing system operators as it is the main reason for choosing one product over another and is normal that these data can be verified during use. For this reason the dishwasher range AC2E feature a standard flowmeter in addition to the partial and total machine run time.



## HPS EASY

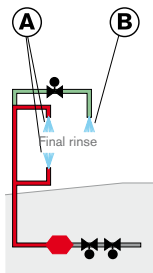
There are various devices that allow the reading and the management of the operation data of dishwashers but they normally require dedicated hardware and software. The AC2E series allows meters to be installed that enable operators to keep a daily check on water and energy consumption, using a dedicated display, and to be advised of any operational faults, without the need for special technologies.

**Consumption reduced  
by up to 33%**



### PRS and APRS

Despite being able to operate at different speeds, conventional rack conveyor dishwashers always use the same amount of rinse water, which causes an enormous amount of waste. Patented PRS (Proportional Rinse System) systems and their automatic version, APRS, which can be incorporated in this range of dishwashers, are a real revolution in this sector as they allow the amount of water to be gauged accurately for the load placed in the machine and the rack transport speed selected, thus reducing water, energy and chemical product consumption by up to 33%.



Rinse

A	1 <sup>st</sup> speed
A+B	2 <sup>nd</sup> speed

**Prewashing  
with savings**



### DHM AUTOMATIC PRE-SCAPPING SYSTEM

DHM stands out among the machine's various accessories. This new scrapping module, with a combination of arms fitted with several multidirectional jets, is installed ahead of the prewash module. The DHM effectively and advantageously replaces the traditional pre-rinse hose, which is the main source of water consumption in the dish washing area.



**Rinse aid reduced  
by up to 70%**



### RAH – Rinse Aid Homogeniser (patented)

Rinse aid has a higher density than water. Because of these characteristics, the two substances cannot mix uniformly and require a greater amount of surfactant in order to achieve good drying results. The optional RAH system, designed to help combine two liquids of differing densities, is the ideal solution to this problem as it reduces the amount of rinse aid required by up to 70%, consequently saving money and reducing the environmental impact.



**RAH** Mixing of two liquids

# Savings

With the ECO2 project, Comenda has achieved considerable results in terms of water, energy and detergent saving, the three most important areas, by implementing a series of state-of-the-art technologies.

## RINSE ECONOMISER

The rinse function in COMENDA rack conveyor dishwashers is only activated when the rack enters the rinse area. This allows enormous amounts of water to be saved, which would otherwise be used to rinse empty spaces.

## HEAT RECOVERY SYSTEM

It allows the machine to be fed by cold water, pre-heating it to a temperature of 45-50°C. Uses the heat and steam that would otherwise be lost in the environment, thus ensuring considerable energy savings. Condenses the steam from the machine and reduces the temperature of outgoing air.

## AUTOTIMER

Reduces consumption by stopping the pumps when there are no dishes being fed into the system, restarting automatically when new racks are loaded.

## MIDWASH PLUS

Unlike what happens in conventional industrial dishwashers, with MWP only 50% of the clean rinse water is sent to the wash tanks, while the rest is sent directly to the prewash. This has a dual effect - the water in the prewash area is renewed much more quickly, with less dilution of the detergent in the subsequent wash tanks and instead of passing through the wash areas in a "cascade system", the rinse water is previously extracted and sent directly to the prewash area. The benefits are obvious and immediate. A dramatic reduction in the amount of detergent used, perfect cleaning and hygiene, lower environmental impact and a proportional economic benefit resulting from reduced consumption.

# Technical data sheet

AC2E SERIES	AC2E / AC2AE	AC2EP5 / AC2AEP5	AC2EP6 / AC2AEP6	AC2EP9 / AC2AEP9
rack production per hour with 2 minutes contact time according to DIN10510	105	130	140	160
maximum rack production per hour	140	195	205	220
standard machine length (linear/corner)	1750/1800	2250/2300	2350/2400	2650/2700
tank load (l)	94	139	139	174
rinse water consumption (l/h) according to DIN 10510	133	180	190	200
power supply (V)	400V 3N 50Hz	400V 3N 50Hz	400V 3N 50Hz	400V 3N 50Hz
installed power (55°C hot water connection) in kW	22,02	25,72	25,88	27,26
consumption per hour in kWh	15,41	18,00	18,12	19,08
installed power (15°C cold water connection with ARC) in kW	31,55	33,75	35,41	37,79
consumption per hour in kWh	20,08	23,62	24,79	26,45
installed power (15°C cold water connection with WP7) in kW	17	19,2	20,9	23,3
consumption per hour in kWh	11,90	13,44	14,63	16,31
PRS	standard	standard	standard	standard
APRS, DHM, RAH, MWP Autotimer	optional	optional	optional	optional

We reserve the right to modify technical features and pictures.

A= corner version



## ECO2: THE WINNING FORMULA FOR SAVING ENERGY

Comenda's philosophy is represented by a green petal, which defines the company's commitment to research and to applying high-tech formulas which combine high performance with energy savings. ECO2 is the key to Comenda's entire production - ecofriendly solutions that ensure excellent results and a healthier working environment. The AC2E range is also inspired by this green philosophy - a vast range of washing systems that can adapt to many different requirements, always ensuring top performance with very low running costs thanks to the reduced use of water and detergent. Low energy consumption is guaranteed by the PRS, APRS and WP accessories and by the economiser, which only activates the rinsing function when the rack passes through the machine, avoiding any waste of water. Comenda's green commitment has resulted in the company's UNI EN ISO 14001:2004 certification issued by the prestigious German TÜV organisation.



## SUPPORT AT THE TOUCH OF A MOUSE

Faithful to its corporate philosophy, Comenda offers both excellent products and an all round support service. In order to provide its customers with the best possible real time support, along with its national and international network of qualified technicians, Comenda provides an easy-to-use online tool. The [www.comenda.eu](http://www.comenda.eu) website includes a section which currently has over 700 registered users and provides support and an online parts ordering system. Customers can access the private area of the website using their password and consult or download the user manual as well as electrical, hydraulic and installation diagrams. Exploded diagrams can also be accessed in a few clicks and orders can be sent automatically and directly to your national spare parts office without error.

