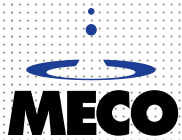




THE MECO  
VAPOR COMPRESSION STILL  
SMARTER. MORE EFFICIENT. MORE RELIABLE.





## PIONEERS AND PERFECTIONISTS IN VAPOR COMPRESSION.

WE PATENTED VC IN 1939.  
WE'VE BEEN PERFECTING IT EVER SINCE.

MECO is the leading manufacturer of Vapor Compression stills for pharmaceutical grade water production with over 1,000 installations worldwide. We have the broadest product line of standard and custom stills with a variety of options. We manufacture Vapor Compression stills that produce purified or WFI-grade water at whatever capacity our customers require.

MECO Vapor Compression stills feature the GII Centurbo™ Compressor. Its directly driven variable speed motor eliminates belt drives, gear transmissions and flex couplings. Bearings are cooled with air and lubricated intermittently with oil. There's no re-circulating oil system with filters, coolers, pumps, plumbing, valves and instrumentation. No oil and filter changes. Maintenance goes down. Efficiency and reliability go up. You get more runtime and fewer headaches.





## GREATER RELIABILITY, MORE EFFICIENCY, REDUCED MAINTENANCE.

EVERYTHING YOU NEED TO GET MAXIMUM  
VALUE OVER THE LIFE OF YOUR STILL.

### TOTAL COST OF OWNERSHIP



### CAPITAL COST + OPERATING COST

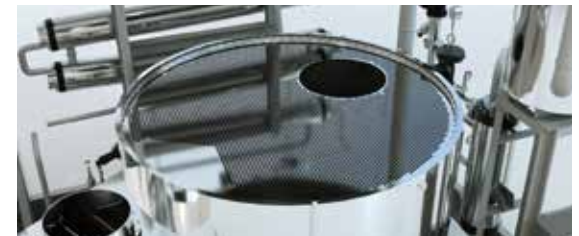
{ GREATER RELIABILITY, MORE ENERGY  
EFFICIENT, REDUCED MAINTENANCE }

## MSS VC FEATURES: GREATER RELIABILITY

The costliest water is that which is not produced when you need it, impacting your planned production. With over 1,000 vapor compression plants deployed throughout the world—many of which have been operating for more than 30 years—you can be assured that our plants are built to last and operate continuously trouble-free.

### VERTICAL TUBE NATURAL CIRCULATION EVAPORATOR

MECO's vertical tube natural circulation evaporator eliminates the need for spray nozzles and circulating pumps to force distribution over heating surface.



### ADVANCED COMPRESSOR TECHNOLOGY

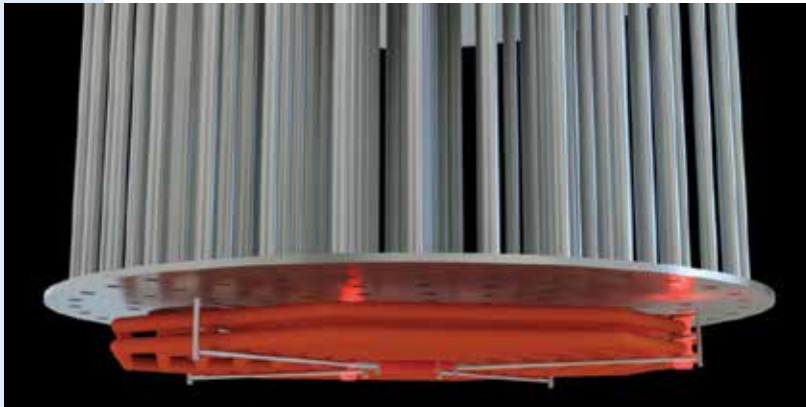
The MECO GII Centurbo™ Compressor drives the process. The design has fewer parts than others, which translates to greater reliability and less maintenance. It is safer and quieter. The L10 design bearing life is greater than 60,000 hours.





### CONTROL SYSTEM

MECO's control system also enhances the system's reliability. MECO MSS VC plants are fully automated and self-diagnostic. As such, they are fully protected and controlled so they can respond accurately to variations in external utilities and start up and shutdown reliably.



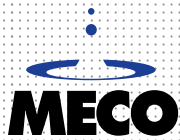
### FAST START-UP AND HOT STANDBY: HEATING COIL

MECO vertical tube VC evaporators have the benefit of utilizing a heating coil within the evaporator combined with an advanced control system for rapid heat-up and hot standby operation. From a cold condition, MECO plants typically come online in 45 minutes and are instantaneously and reliably started from a hot standby condition.



### WATER QUALITY

Even with minimal pretreatment, MECO stills routinely run with a conductivity of about 0.25 microsiemens (uS). That's five times lower than industry requirements and four times lower than other distillers. How do we do it? By stripping the feed water of gasses such as CO<sub>2</sub> and ammonia that contribute to high conductivity, and oxygen that contributes to corrosion, before they enter the system.



## MSS VC FEATURES: REDUCED MAINTENANCE

### ENGINEERED TO ENSURE MINIMUM MAINTENANCE FOR MAXIMUM PRODUCTION UPTIME

When it comes to maintenance, you will have to assess the scope of work and the frequency of activity to evaluate the costs. You will be glad to know that the MECO GII compressor uses an air oil system for lubrication. Because there is no recirculating oil system, there are no filters to replace, no oil to change or dispose of and no heat exchanger and pumping system to maintain. Your activity is limited to simply adding oil to the air/oil system every six months of continuous operation. Similarly, there are no recirculation pumps, no spray nozzles and fewer gaskets and valving.

### COMPRESSOR DIRECT DRIVE SYSTEM



The MECO GII is the only true direct drive system on the market. Other fans use intermediate couplings to connect the fan to the motor, which requires alignment, additional bearings, and dual circulating oil systems as well

as external cooling fans and motors. The MECO GII has only one shaft connecting the motor and the impeller, so there is no alignment

necessary. The housing is water-cooled and the bearings are air-cooled with only oil for lubrication. The GII size and weight means there is less torque on the motor when starting up and less wear and tear due to imbalance.

### COMPRESSOR REMOVAL



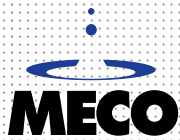
The GII can be completely replaced in less than two hours if necessary with minimal

interruption in service. The compressor is integrally mounted, eliminating the need for excessive ductwork and gasketing.

### DRAIN-ABILITY

All piping on a MECO still is sloped to 2 degrees and valves are angled in accordance with industry standards for drain-ability.





## EASE OF ACCESS

There is only one pump—the distillate pump—and it is easily accessible from the edge of the skid, as is the air/oil system. They are not wedged between other components that would make them difficult to access.



## QUIETER OPERATION

Operating at only 72 – 80 dBA, MECO's GII Centurbo™ Compressor is about as loud as a vacuum cleaner. You don't need acoustic walls or personal hearing protection. Because people in adjoining spaces aren't affected, you can position your water room just about anywhere, even right next to an office. The low noise level eliminates the need for special OSHA compliance reporting. Your water room works better and is a better place to work.



## MSS VC FEATURES: MORE ENERGY EFFICIENT

### BUILT WITH YOU AND OUR ENVIRONMENT IN MIND

The energy consumption of your distiller represents the largest expenditure over its lifetime. MECO MSS VC plants are the most energy efficient in the industry. Given the same feed water temperature, discharge temperatures and flow rates, the steam consumption of VC distillation plants should nearly be identical and significantly less than multiple effect distillation. However, MECO's large surface area evaporators use less electrical power, translating to the lowest cost per thousand gallons produced.





**DESIGNED AND  
MANUFACTURED  
BY THE WORLD'S  
FOREMOST WATER  
PURIFICATION  
EXPERTS, TAILORED  
TO FIT THE WORLD'S  
MOST IMPORTANT  
PROJECTS—YOURS**

MEETING AND EXCEEDING  
STANDARDS ISN'T JUST A POLICY,  
IT'S OUR CULTURE.

## OVERVIEW

- Leading manufacturer of vapor compression stills for pharmaceutical water, with over 1,000 installations worldwide
- Produces purified water (USP Purified) and Water For Injection (WFI) in accordance with the U.S. Pharmacopeia
- Built to the exacting standards of the pharmaceutical industry and cGMP requirements
- Superior energy efficiency
- All components are manufactured by MECO in the U.S. (Spare parts available)
- Supported by MECO 24-hour customer service
- Backed by warranty

## VC STILL MODELS

MODEL	CAPACITY GPH (M <sup>3</sup> /H)
PES300MSSH	300(1.1)
PES400MSSH	400(1.5)
PES600MSSH	600(2.3)
PES800MSSH	800(3.0)
PES1000MSSH	1000(3.8)
PES1200MSSH	1200(4.5)
PES1600MSSH	1600(6.1)
PES2400MSSH	2400(9.1)
PES3000MSSH	3000(11.3)
PES4500MSSH	4500(17.0)
PES6000MSSH	6000(22.7)
PES7500MSSH	7500(28.4)



## PRODUCT HIGHLIGHTS

### Superior Design

- Vertical natural circulation evaporator
- Feed water quality tolerance
- Scale effects reduced
- No pumps or spray nozzles
- Straight annealed tubes in evaporator
- Individual tubes can be replaced as opposed to replacing the entire bundle
- No residual stresses or surface finish problems commonly found with U-tubes
- Deaeration of feed water

### MECO Vapor Compressor

- Manufactured by MECO
- Immediate spare parts availability
- Exchange program
- Inconel impeller and 316SS process
- Contact components
- New Lube Lock Sealing System
- Directly mounted with no vapor duct work
- Space friendly
- Smaller footprint
- Easy access for maintenance

- Non-condensibles removed prior to distillation
- Corrosion reduction
- Hot stand-by
- Immediate production of distillate
- Elimination of bio-growth
- Meets/exceeds cGMP/USP standards
- Sanitary construction and connections
- Double tubesheet heat exchangers
- Sloped piping and low point drains
- Minimum deadlegs

### Design Details

- Allen Bradley PLC control system
- 25 Ra standard process contact surfaces
- Galvanized rigid steel conduit
- Stainless steel airlines
- Mirror finish stainless steel cladding





**WHEREVER GREAT COMPANIES ARE  
MAKING A DIFFERENCE, YOU'LL FIND  
MECO-MADE VC EQUIPMENT AND SUPPORT.**

WORLDWIDE REACH, PERSONAL SERVICE: THAT'S THE MECO WAY.

IRELAND



UNITED ARAB EMIRATES

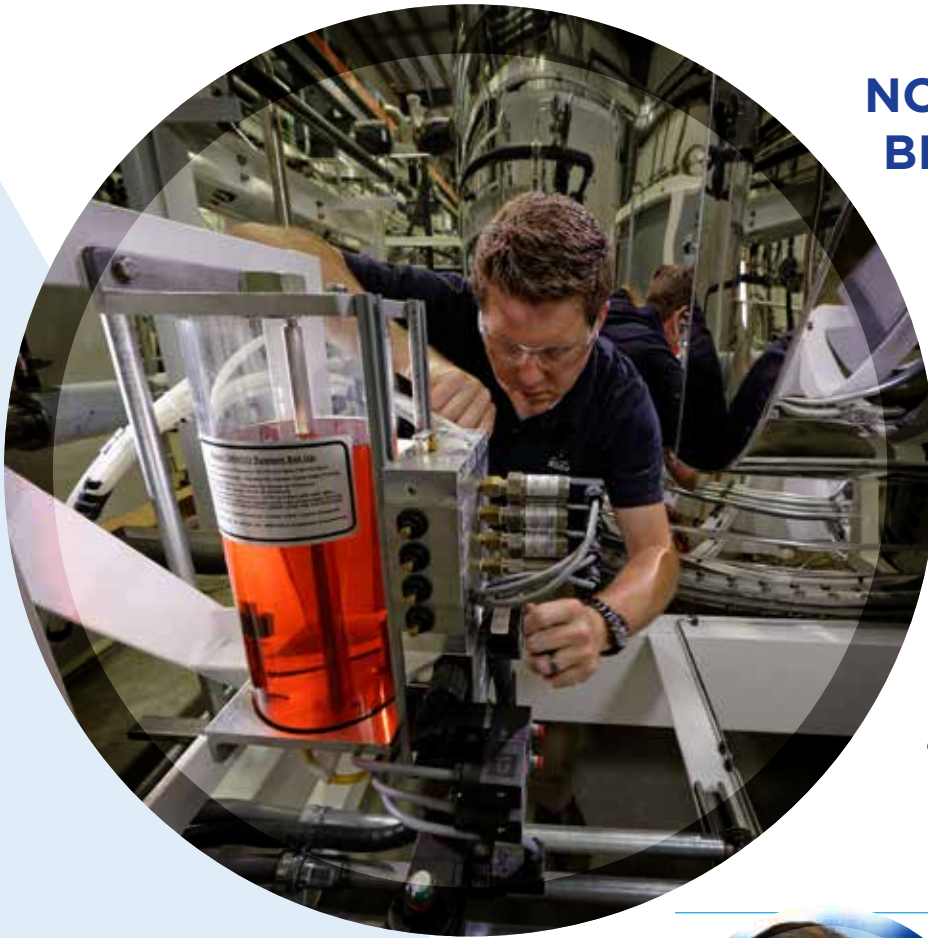


UNITED STATES



SINGAPORE





## NOT JUST THE BEST EQUIPMENT—THE BEST TECHNICIANS AND SUPPORT, TOO.

### THAT'S THE MECO MASTERSUPPORT™ DIFFERENCE.

Our water purification plants are everywhere and our people are too. You'll find us across the globe supporting our products. We know that maximum uptime is critical to your productivity, so when you have a problem, you have a knowledgeable service representative on hand. You can rest assured that MECO service personnel are factory-trained specialists supported by our entire organization.

The design, construction, operation and maintenance of water purification plants is not a sideline for us, it's all we do. When you communicate with us, everyone on the MECO team knows what is expected.



“*The technologies used to produce pure water are not simple. They use sophisticated control systems to produce water to exacting standards from sources that are often variable. Our people are trained experts backed up by experts. We've seen a lot over the years, but we never stop learning.*”

**BILL ESSARY, SERVICE MANAGER**



## MSS VC RETROFIT

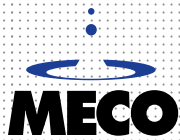
The exacting standards of purifying water demand that your plant always run at its optimal capabilities. A task that gets more and more difficult as it ages. Normal wear and tear, along with technological advancements, have led companies to rely on MECO for our retrofit and upgrade services.

MECO extends the life of distillers and other water treatment systems by offering control system upgrades and refurbishments. The benefits of this service include:

- An extension of the distiller's life, reducing the capital outlay for new equipment
- An updated system to meet higher quality assurance and validation standards
- Improved operation of the plant through more accurate operating control, higher equipment reliability and reduced maintenance

One area that is particularly vulnerable is the control system. Plants more than five years old may be equipped with older programmable logic controllers (PLCs), single loop electronic controls, mechanical floats or pneumatic controllers that are becoming obsolete. This can often lead to a lack of consistency between distillers within their facility.

**SERVICES:** Engineering Design | Installation | Commissioning | Validation | Preventative Maintenance | Retrofit/Upgrades | System Analysis/Consulting | Education and Training MECO MASTERsupport™ Service Center



**PURE  
STEAM**



**CARBON FILTERS  
& SOFTENERS**



**VAPOR  
COMPRESSION**



**ULTRAFILTRATION**



**REVERSE OSMOSIS**



**MASTERPAK™  
(PRETREATMENT,  
RO & EDI)**

## AN UNMATCHED COMMITMENT TO BIOPHARM PAIRED WITH UNPARALLELED EXPERIENCE.

### THE RESULT: GREATER RELIABILITY FOR YOUR OPERATION.

With over 1,000 water purification machines successfully installed across the globe, MECO serves leading pharmaceutical and biotech companies with over 25 million gallons of product water every day.

The MECO global portfolio includes the broadest range of engineered products for purified water and WFI. This depth of global experience ensures we understand the critical nature of maximized uptime for your operations. This is why all of our processes are built around you.

Whatever your requirements—from pre-treatment through production, storage and distribution, a single unit at any size or a complete integrated and turnkey installation—MECO answers with the ideal combination of highly experienced engineers, state-of-the-art manufacturing and first-class service.

### MECO BIOPHARM PRODUCT LINE

MECO's extensive knowledge of water purification has made us a trusted source for Water for Injection (WFI), purified water and steam. We use that expertise on behalf of our clients to develop new and more efficient solutions featuring a wide spectrum of purification products and solutions. Because we're able to seamlessly integrate all of our services and products to maximize efficiency, we're often called upon to oversee the entire process. And MECO equipment has long been considered the best in the industry.



## SAMPLE CUSTOM SYSTEM

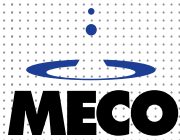
This solution is for a large medical device manufacturer requiring substantial amounts of Purified Water for rinsing and WFI. The turnkey project was installed and validated by MECO in less than eight months.

**PRODUCTS:** Carbon Filtration | Clean Steam Generators | Electrodeionization Ion Exchange | Micro- and Ultrafiltration | Multiple-Effect Stills | Reverse Osmosis Storage and Distribution Systems | Vapor Compression | Water Softening



“We are relentless about finding the best solution to our customers’ needs. One that offers the highest quality of product while reducing operating and capital costs. Our entire team, from engineering to manufacturing to service, takes a studied and methodical approach to everything we do. It’s part of our culture and a key component of our DNA.”

**CHET NUNEZ, DIRECTOR OF APPLICATIONS**



## PURELY DEDICATED TO WATER.

### OUR SOLE FOCUS ON PURIFICATION SOLUTIONS LETS YOU FOCUS ON THE BIG PICTURE.

We are engineers, so identifying the ideal solution to complex problems is something that comes naturally to us. Our entire culture is built around the values of attention to detail, problem solving and working in the most efficient manner possible. As a company, our engineers, our lean manufacturing team and our quality service department work in synergy to deliver the most logical solutions to your exacting specifications.

Moreover, once the right solution is found, our engineering approach pays continuing dividends through an efficient system design, ensuring validation, preventive maintenance and offering the peace of mind that comes with the continuing support from true problem solvers.

# >98%

**of customers surveyed are consistently satisfied or very satisfied.\***

**MECO's customer satisfaction rating**

\*2015 MECO customer survey.



## MECO WATER RUNS THROUGH A WIDE RANGE OF INDUSTRIES

We developed new technology that allows the U.S. Army to make fresh water from contaminated water in combat zones. We desalinate seawater so oil and gas companies can fuel the world.

Our systems produce pharmaceutical-grade water for lifesaving drugs and the water that gives soda its pop.

MECO is the leader in the engineering and manufacturing of water purification solutions for

pharmaceutical, industrial, oil and gas, military and food and beverage enterprises. This legacy of leadership is the result of our commitment to the highest quality of products and services in everything we do. And this unparalleled breadth of experience in all industries helps us provide better solutions for you, no matter your pure water requirements.



“ Our focus is squarely on the industry, technology and most importantly our customers. We enjoy establishing trusted relationships and a commitment to one another that lasts a lifetime. ”

**GEORGE GSELL, PRESIDENT**



## CONTACT US

Whether you need us to provide a single vapor compression distillation unit or design an entire system from scratch, MECO will deliver the solution that works best in terms of cost, efficiency and absolute water purity. For more information, please contact your MECO representative. You can also visit us online at [MECO.com](http://MECO.com).

## BUILT WITH YOU AND OUR ENVIRONMENT IN MIND.

MECO's new manufacturing facility in Mandeville, Louisiana, is more than just a state-of-the-art home for our manufacturing operations—it's the ultimate expression of the MECO commitment to our customers, employees and environment. Building off more than 87 years of experience, we've designed a facility to maximize safety, productivity, functionality and overall quality for our customers. Our 80,000-square-foot home combines the most advanced technology with environmentally friendly practices in an ideal setting surrounded by indigenous trees, plants and water habitats to support the local wildlife.





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