MESP multi-effect stills

Spirax Sarco’s range of multi-effect stills are designed for use within the biopharmaceutical industry and to meet all the requirements that this industry demands.

With over 100 years of experience in steam control and heat transfer technology we have the knowledge and expertise to optimise the design of our MES to consistently provide you with pyrogen free pharmaceutical grade Water For Injection.

Spirax Sarco’s MES will satisfy the requirements of International Pharmacopeia standards, whilst offering you exceptionally low cost of ownership and guaranteed performance.

Manufacturing and design standards

- European Pressure Equipment Directive 97/23/EC
- ASME - Section VIII Div I
- Optional FDA 21 CFR Part 11 compliance
- GAMP
- cGMP
- ASME BPE
- cGMP design and regulatory compliance
- Unique optimised multi-tube downcomer
- cGAMP double tube sheet heat exchanger on first effect
- Capacity range from 100 kg/h

Optimised design

- Evaporation chamber dimensions optimised for enhanced separation eliminating carryover.
- Through the employment of specific software calculations your individual requirements are used to ensure the optimal number of effects with increased energy efficiency.
- First effect PID level control guarantees system efficiency and operation consistency throughout the operating range of the unit.
- Unique column design with external multi-tube configuration maximises heat transfer, increasing the performance and energy efficiency of the unit.
- Three distinct and optimised separation techniques guarantee the consistent production of pyrogen-free pharmaceutical grade Water For Injection.

MES range at a glance

Production and consumption

When the available steam pressure = 7 bar g

<table>
<thead>
<tr>
<th>Model</th>
<th>Number of effects</th>
<th>WFI actual production (kg/h)</th>
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</tr>
</thead>
<tbody>
<tr>
<td>MES100 /3</td>
<td>3</td>
<td>126</td>
<td>52</td>
</tr>
<tr>
<td>MES200 /3</td>
<td>3</td>
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</tr>
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<tr>
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<tr>
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<tr>
<td>MES8000 /4</td>
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<td>5300</td>
<td>1680</td>
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</tbody>
</table>

Please note - Higher capacities and additional effects to further enhance your life cycle costs are available on request, please contact your Spirax Sarco high purity specialist who will be pleased to discuss your requirements.

MES operating principles

The Spirax Sarco MES employs the multi-effect distillation principle.

1. Feedwater is supplied to the first effect column via the distillate cooler and pre-heater double tube sheet heat exchangers.
2. Plant steam is applied to the first effect evaporation column where the feedwater is vaporized and pure steam produced.
3. Pure steam produced inside the first effect is applied to the following effects to preheat and produce pure steam. The condensed pure steam forms the WFI product.
4. Pure steam produced in the final effect is condensed by passing through the feedwater preheater and final cooling heat exchanger.
5. Distillate WFI is released at the outlet.

MES options

To supplement our standard MES we offer pre-engineered options, ensuring a solution specifically optimised for your process.

A complete list of available options is detailed within the MES Technical Information (TI) sheet available on our website, alternatively contact your local Spirax Sarco High Purity representative.
Key features and benefits

**Key features**

- **Distillate/WFI production**: Consistently provides pyrogen-free pharmaceutical grade Water For Injection.
- **PID level control**: Unique sanitary PID level control guarantees consistent system efficiency and performance.
- **Full validation documentation available**: Fully documented factory acceptance test as standard. Extensive protocol templates for installation and qualification activities are available.
- **Spirax Sarco quality components**: Spirax Sarco components ensure overall system quality integrity.
- **High purity tests with real application knowledge and understanding of WFI loop**: We guarantee to deliver your high grade WFI every time.

**Key benefit**

- **Compliant to all International Pharmacopeia and Standards**: The MES complies with US, European and Japanese Pharmacopeia, FDA, ASME BPE and ISPE Baseline Guides.
- **Effects selection based on energy efficiency**: Dedicated software to calculate optimised number of effects for maximised plant steam efficiency.
- **PID level control**: Unique sanitary PID level control guarantees consistent system efficiency and performance.
- **Full validation documentation available**: Fully documented factory acceptance test as standard. Extensive protocol templates for installation and qualification activities are available.

**Group companies**

<table>
<thead>
<tr>
<th>Africa</th>
<th>Australasia</th>
<th>Americas</th>
</tr>
</thead>
<tbody>
<tr>
<td>South Africa</td>
<td>Australia, New Zealand</td>
<td>Argentina, Brazil, Canada, Mexico, USA</td>
</tr>
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**Sales offices**

<table>
<thead>
<tr>
<th>Africa</th>
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<tbody>
<tr>
<td>Egypt, Antalya, Nigeria</td>
<td>Colombia, Venezuela</td>
</tr>
</tbody>
</table>

**Distributors**

- **Africa**: Algeria, Cameroon, Ethiopia, Ghana, Ivory Coast, Libya, Morocco, Monastir, Namibia, Senegal, Sudan, Tanzania, Tanzania, Uganda, Zambia, Zimbabwe
- **Americas**: Argentina, Brazil, Chile, Colombia, Costa Rica, Dominican Republic, Ecuador, El Salvador, Guatemala, Honduras, Panama, Peru, Colombia, Paraguay, Costa Rica, Uruguay, Venezuela, Dominican Republic, Ecuador, El Salvador, Guatemala, Honduras, Panama, Peru, Colombia, Paraguay, Costa Rica, Uruguay, Venezuela
- **Europe**: Austria, Belgium, Bulgaria, Croatia, Cyprus, Estonia, Greece, Finland, France, Germany, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey, UK
- **Asia**: Bangladesh, China, Indonesia, Malaysia, Singapore, Taiwan, Thailand, Vietnam
- **Australasia**: Australia, New Zealand
- **Middle East**: Bahrain, Iran, Israel, Jordan, Kuwait, Lebanon, Oman, Qatar, Saudi Arabia, Syria
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Spirax Sarco’s range of multi-effect stills are designed for use within the biopharmaceutical industry and to meet all the requisites that this industry demands. With over 100 years of experience in steam control and heat transfer technology we have the knowledge and expertise to optimize the design of our MES to consistently provide you with pyrogen free pharmaceutical grade Water For Injection.

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Designed and manufactured by Spirax Sarco

MES operating principles

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Optimised design

• Evaporation chamber diameter optimised for enhanced separation eliminating carryover.
• Through the employment of specific software calculations your individual requirements are used to ensure the optimal number of effects with increased energy efficiency.
• First effect PID level control guarantees system efficiency and operation consistency throughout the operating range of the unit.
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Optimised plant steam control and ancillaries

- Evaporation, condensate and blowdown heaters optimised for high efficiency.
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